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# HARVARD HISTORICAL STUDIES

PUBLISHED UNDER THE DIRECTION OF  
THE DEPARTMENT OF HISTORY

FROM THE INCOME OF  
THE HENRY WARREN TORREY FUND

VOLUME LVI



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THE MINING GUILD  
OF NEW SPAIN  
AND ITS  
TRIBUNAL GENERAL

1770-1821

*By*

WALTER HOWE



*Cambridge*

HARVARD UNIVERSITY PRESS  
LONDON : GEOFFREY CUMBERLEGE  
OXFORD UNIVERSITY PRESS

1949

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TO THE MEMORY OF MY FATHER

ERNEST HOWE

MINING GEOLOGIST AND LOVER OF MEXICO



## PREFACE

EVER SINCE the Spanish Conquest, Mexico's most important industry has been mining, including in this general term the extraction of petroleum. This industry has contributed immense sums to Spain, to Mexico herself, and to many foreign investors, and has always engaged the special attention of the government of the country. The laws regarding subsoil products have had an effect beyond the borders of Mexico, causing at times serious international disputes and influencing sensibly the early mining law of the richest mineral regions of the United States.

One of the greatest eras of prosperity in the history of Mexican mining came at the end of the Colonial period. In these years, from 1770 to 1820, the industry was organized as a guild known as the *Cuerpo de Minería*, a body with a Tribunal General as its executive head and many rather unusual privileges of autonomous jurisdiction. Humboldt, Alemán, Bancroft, Priestley, and other writers on Mexico have referred to this organization, but there has been no thorough study of the manner in which it was created, its history, and what it contributed to the mining industry and the country as a whole. The investigation of which this monograph is the result was undertaken with the hope of throwing some light on these questions. It seemed worth while, not only because of the importance of mining in the life of the country, but because the *Cuerpo de Minería* with its relative autonomy, its representative character, and the fact that it was conducted principally by Creoles, appeared almost unique in colonial Mexico. If, as this study shows, the history of the Mining Guild included its share of failures, it made a number of contributions of lasting value. The mining ordinances of 1787, drawn up by the Tribunal, were extended to all the Spanish possessions in the New

World and were the basis of the mining law of California. The School of Mines, planned and directed by the Tribunal, was the first serious engineering or technical school in the Western Hemisphere, and continued to play a useful role in Mexico long after the Mining Guild had been dissolved.

This is primarily institutional history. I have attempted to describe as completely as possible the creation of the *Cuerpo de Minería* and its Tribunal General, their subsequent history, their accomplishments and failures. This principal theme also serves the indirect purpose of affording information on the ordinary administrative routine of the Government of New Spain at that time; occasionally events and procedure which were of no particular importance in the treatment of the central theme have been described because of the light they shed on this subordinate topic. Similarly there is some information on such matters as the technical development of the industry, wages and salaries for different occupations, and taxation, although these are all incidental to the main purpose.

This study is based on the various sources listed in the bibliography, principally unpublished documents in the archives of Mexico and Seville. Many of the original records of the Tribunal have been lost or dispersed; it is possible that discovery of the complete records would modify some details and fill in certain gaps in the story. I do not believe it would change substantially the general picture as drawn here or the conclusions as to the value of the institution.

The original suggestion that the *Cuerpo de Minería* might offer a fruitful field for research came from Professor Clarence H. Haring of Harvard University, under whom I had the privilege of doing my graduate work. Throughout the course of this study, which has been frequently interrupted by periods of public service in both peace and war, Professor Haring's encouragement, advice, and friendly criticism have kept it alive and have now made it possible for the volume to appear in print. While acknowledging with affectionate gratitude my

great debt to him, I must, of course, assume responsibility for the accuracy of the facts brought out and the conclusions reached. Professor Haring's original suggestion found immediate support from my father, the late Dr. Ernest Howe, mining geologist and sometime advisor to the Mexican Geological Survey, who gave me an early interest in both Mexico and the mining of precious metals.

It is also a pleasure to express my deep appreciation for advice and friendly assistance to the late Don Luis González Obregón, Mexican historian and archivist, to Dr. López, former director of the Archivo Nacional de la Nación of Mexico, Don Federico Gómez de Orozco of the Museo Nacional, Professor Pablo Martínez del Río of the Universidad Nacional de México, and the staffs of the Archivo General in Mexico and the Archivo de Indias in Seville. Acknowledgment is also due to Mr. George Conway, who generously loaned me certain equipment for the microphotographing of documents, and Miss Katherine Daniels for long hours spent in typing parts of the manuscript. Finally, the publication of this monograph would not have been possible without the long-suffering patience, helpful criticism, and active assistance of the members of my immediate family.

WALTER HOWE

*Litchfield, Connecticut*

*June 1948*





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## ABBREVIATIONS

*A.G. Virreyes* — Archivo General de la Nación, Mexico; Sección de Correspondencia de los Virreyes.

*A.G. Cédulas* — Archivo General de la Nación, Mexico; Sección de Reales Cédulas y Ordenes.

*A.G. Minería* — Archivo General de la Nación, Mexico; Sección de Minería.

*A.I., Sec. 5, Aud. de Méx.* — Archivo General de Indias, Sevilla; Sección 5, Audiencia de México.

*H.A.H.R.* — *Hispanic American Historical Review*.

See Bibliography for a fuller description of these sources.



**THE MINING GUILD OF NEW SPAIN AND ITS  
TRIBUNAL GENERAL, 1770-1821**



## CHAPTER I

### THE MEXICAN MINING INDUSTRY BEFORE 1770

Pues siendo la Minería el Origen y único manantial de la riqueza numeraria que da espíritu y movimiento a las demás ocupaciones de los hombres y al universal comercio de todo el orbe descubierto, pide de justizia los principales atenciones del Gobierno, y debiera haberse mirado siempre con el particular cuidado y protección que hoy merece al Rey Nuestro Señor.<sup>1</sup>

WHEN José de Gálvez, the great minister and colonial inspector of Charles III, wrote the lines quoted above in 1771, the mining industry of New Spain stood on the threshold of a new epoch. Within a few years it was to receive royal recognition which gave to it a dignity and autonomous authority shared only by the great commercial guilds of Old and New Spain. To appreciate the developments during the last half century of Spanish rule, it is necessary to have some understanding of conditions before that time. These were characterized by a lack of formal organization of the industry and confusion in the administration of the laws pertaining to it.<sup>2</sup>

In 1779, the miners of Mexico operated under the provisions of the so-called New Code of Mining Laws. These ordinances, framed by Philip II for the mines of Spain and promulgated in 1584, were later added to the *Recopilación de Castilla* as *Lib. 6, Tit. 14, Ley 9* and incorporated in this collection in the

<sup>1</sup> *Informe General que . . . entregó el . . . Marqués de Sonora . . . al Virrey Frey D. Antonio Bucarely y Ursua con fecha de 31 de diciembre de 1771*, Mexico, 1867 (hereafter cited as *Informe General del Marqués de Sonora*), pp. 63-64.

<sup>2</sup> "El gremio o comunidad de los Mineros de esta Nueva España, es uno Cuerpo (si merece este nombre) no solamente acéphalo, sino que carece de toda organización." Velasquez de León and Lassaga: *Representación a nombre de la Minería de esta Nueva España* (1774). Art. 21 — A G. Minería, XI, 359-442. (For a fuller description of this important document cf. below, pp. 40-45.) Also *Informe General del Marqués de Sonora*, p. 70.



edition of 1640.<sup>3</sup> It is called the New Code to distinguish it from the older ordinances collected under Law 5 of the same title and from other earlier laws concerning mining. These older laws continued to be in force except where contrary to the rules of the New Code.<sup>4</sup> Although these various codes, both old and new, were originally framed for Castile, they were specifically extended to the Indies by various royal orders.<sup>5</sup> While the various viceroys, or the Audiencia, at times issued supplementary ordinances affecting particular provinces or special situations, this sixteenth-century code remained the fundamental mining law of Mexico until the promulgation of the famous Mining Ordinances of 1783.<sup>6</sup>

Under this code, the ultimate ownership and title to all mines remained with the crown, while the "dominium utile," or right to work mines, was conceded freely to individuals.<sup>7</sup> This was a gradual development from earlier law and practice concerning the property in mines. Under the Civil Law, deposits of precious metals belonged to the sovereign if in public lands, and to the owner if in private lands, subject to a royal tax.<sup>8</sup> In Spain under the laws of the *Siete Partidas* and the later *Ordenamiento de Alcalá*, all mines and mineral deposits wheresoever situated were declared to be the property of the sovereign and not to pass to a new owner with the transfer of the surface. Under these laws, mines could only be worked by private individuals under special royal license.<sup>9</sup> This was modified by John II to allow any person to work mines on his own property, or on

<sup>3</sup> *Recopilación de las Leyes de Estos Reynos (de Castilla)*, 3 vols. (Madrid, 1640). (Cited as *Recopilación de Castilla*.)

<sup>4</sup> Francisco Xavier de Gamboa, *Comentarios a las Ordenanzas de Minas* (Madrid, 1761), chap. i, pp. 3-4.

<sup>5</sup> *Recopilación de Leyes de los Reynos de las Indias*, 4<sup>a</sup> impresión (Madrid, 1791). Cited as *Recopilación de Indias*, Lib. 2, Tit. 1, Ley 3; Lib. 4, Tit. 19, Ley 6; Gamboa, chap. i, Sec. 10.

<sup>6</sup> Gamboa, *op. cit.*, chap. i, Sec. 10.

<sup>7</sup> Ords. II and LXVII of the New Code (*Recop. de Castilla*, Lib. 6, Tit. 13, Ley 9). *Recopilación de Indias*, Lib. 4, Tit. 19, Ley 1.

<sup>8</sup> Gamboa, *op. cit.*, chap. ii, Secs. 1-4.

<sup>9</sup> *Partida 2, Tit. 15, Ley 5* (Los Códigos Españoles, 12 vols. Madrid, 1847-1850), vol. 2, p. 423.

that of another with the owner's permission, upon payment of two thirds of the produce to the crown.<sup>10</sup> Philip II, feeling that the mines of Spain were not being exploited with sufficient vigor, revamped the whole system. He first of all revoked all exclusive grants which had been made to bishops or powerful nobles and vested all mines in the crown.<sup>11</sup> He then decreed that any person should be free to discover and work mines with or without the permission of the owner of the surface, upon payment of the royal fifth.<sup>12</sup> Similar concessions of the Emperor Charles V and Philip II made the mines of the New World common to all their subjects, both Indian and Spanish, with freedom to explore and work them at will, subject to payment of the royal dues.<sup>13</sup> Because of the broad terms of these grants some doubt was expressed as to whether the crown had retained its regalian property rights in the mines of the Indies or whether they were to be considered the absolute property of the subject discovering and working them. The two learned writers, Lagúnez and the Cardinal de Luca, held that the mines of the Indies, like other property, could be acquired in full ownership by private persons, subject only to the tax on the produce.<sup>14</sup> Solórzano does not make any definite statement as to the royal rights except that of the fifth.<sup>15</sup> Gamboa, however, came to the definite conclusion that the crown retained its absolute right in the mines of the Indies just as in those in Spain, granting to individuals only the *dominium utile*, or beneficial right.<sup>16</sup>

To sum up, then, any person<sup>17</sup> was free to discover and work mines of gold and silver anywhere in Mexico, with or without

<sup>10</sup> *Ordenamiento*: Lib. 6, Tit. 1, Ley 5.

<sup>11</sup> *Recop. de Castilla*: Lib. 6, Tit. 13, Ley 9, Ord. 1.

<sup>12</sup> *Ibid.*, loc. cit., Ords. 2-8; cf. also, Gamboa, chap. ii, Secs. 5-12.

<sup>13</sup> *Recop. de Indias*, Lib. 4, Tit. 19, Ley 1.

<sup>14</sup> Lagúnez: *De Fructibus* I, cap. 10, Secs. 63-65; De Luca: *de Regalia*, disc. 147, No. 22, cited by Gamboa, chap. ii, pp. 10-12.

<sup>15</sup> Juan de Solórzano Pereyra, *Política Indiana*, 3<sup>a</sup> impresión (Madrid, 1736), Lib. VI, cap. 2.

<sup>16</sup> Gamboa, *op. cit.*, chap. ii, Secs. 16-24.

<sup>17</sup> Certain civil and ecclesiastical officials were excepted from this general

the permission of the owner of the surface. His right in such mines as he might discover or denounce was a conditional right, dependent on the fulfillment of certain obligations such as registering his discovery before a justice and working the mine more or less continuously.<sup>18</sup> As long as these rules were heeded the subject had a definite beneficial property right in the mines, a right that could be sold, bequeathed, or otherwise transferred like any other property. The rights of the crown in mining property were kept alive by the enforcement of these rules and by the obligation of the miner to pay the crown the royal fifth of all ore produced.

Under this general framework the mines of silver and gold had developed during the 250 years following the Conquest. It was a haphazard development, almost wholly in the hands of individuals. It is true that besides the generous legislation already referred to, the government, by controlling the supply and price of quicksilver and by lowering the royal tax, was able at times to stimulate the mining industry. But it was an army of individuals, ranging from lowly Indian to Spanish grandee, which, scattered in all directions, through thousands of square miles of mountain fastnesses, produced the precious current that flowed into the Royal Mint of Mexico and thence into the commerce of the empire.

There is some disagreement as to the first mines worked by the Spaniards after the Conquest. Silver and gold were known and worked in Mexico long before the arrival of the Spaniards; but it seems probable that most of this was from placers or shallow pits where the ore-bearing veins ran near the surface, as the Aztecs and other tribes lacked the equipment for sinking deep shafts. Tradition has it that Cortés sent silver extracted from mines in the vicinity of Taxco to his sovereign.

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grant. Cf. Ord. LXVII of Lib. 6, Tit. 13, Ley 9, *Recop. de Castilla*; Gamboa, *op. cit.*, chap. ii, Secs. 27-37.

<sup>18</sup> For a full discussion of these rules and obligations, see Gamboa, *op. cit.*, chap. iii-vi, vii, xv, xvii, xviii.

This legend was given authority by Gamboa and followed by most later writers.<sup>19</sup> It is challenged, however, by García, who claims that no mines were worked in Taxco until 1549.<sup>20</sup> Whatever the truth of the legend, the first real discoveries of mineral deposits came as a sequel to the conquest of New Galicia in the thirties by Nuño de Guzmán. In 1543 an Indian in the service of Doña Leonor de Arias, the poor widow of one of Guzmán's officers, brought her some silver ore and showed her the deposit, close to Compostela, capital of New Galicia and somewhat to the northwest of Guadalajara. The pious Doña Leonor, with the faithful Indian as major-domo, immediately began to work the mine which she named "Espíritu Santo," and soon became wealthy. The fame of the bonanza spread and active prospecting followed throughout the region.<sup>21</sup>

In September 1546, Juan de Tolosa, acting under orders from Cristóbal de Oñate, Governor of New Galicia, established his headquarters near the present city of Zacatecas. By a combination of force and wise diplomacy, he gradually subdued the Indians of the region, but it was some time before they would show the Spaniards the location of silver deposits, while the prospecting efforts of the latter were unavailing. Finally, in January 1548, with the help of the Indians, the Spaniards discovered the San Bernabe vein. Immediately Zacatecas began to produce silver and was soon the most important mining center in the country.<sup>22</sup>

By this time the tide of discovery was flowing full and in the course of the next few years most of the great historic

<sup>19</sup> Gamboa, p. 509; Santiago Ramírez: *Noticia Histórica de la Riqueza Minera de México* (Mexico, Sec. de Fomento, 1884), pp. 28-31.

<sup>20</sup> Trinidad García: *Los Mineros Mexicanos* (Mexico, Sec. de Fomento, 1895), pp. 133ff.

<sup>21</sup> García, *op. cit.*, pp. 105-111; Luis Pérez Verdía, *Historia Particular del Estado de Jalisco*, 3 vols. (Guadalajara, 1910), I, 185.

<sup>22</sup> García, *op. cit.*, pp. 112-118; T. Flores, "Etude Minière du District de Zacatecas," *Rapports du X<sup>e</sup> Congrès Géologique International* (1906), vol. XVII. Niceto de Zamacois, *Historia de México*, 18 vols. (Mexico, 1878-1888), IV, 560; Verdía, *op. cit.*, I, 188.

mining centers of Mexico had begun to give forth the treasures which, in ever-increasing quantities, they have yielded for close to four centuries. The next important discoveries were in the neighborhood of Guanajuato. A glance at the map will show that this city is on a direct line from Zacatecas to Mexico, and thus it was on the road over which the ore from the new mines was brought to the capital. In 1548 a convoy returning to Zacatecas camped on the "Hill of Light" and discovered traces of silver in the outcroppings of rock. The resulting mine was named S. Bernabe after the first discovery in Zacatecas, and as word spread miners flocked in from all sides. This was soon followed by the discovery of other famous mines, such as "La Luz," "Mellado," and "Rayas," and finally, in 1558, the "Veta Madre." This famous vein, with those of Real del Monte and the Comstock Lode the richest in the world, brought Guanajuato its renown and for centuries made it "Mexico's treasure-house."<sup>23</sup>

The year after the discovery of Guanajuato came the beginning of the mines of Taxco, Sultepec, and Temascaltepec — the first in the present State of Guerrero, the latter two in the State of Mexico, and all within a radius of one hundred and fifty miles of the capital. Although not as famous as Guanajuato, these districts are still producing silver, and Taxco in the eighteenth century was one of the most important centers in the country.<sup>24</sup>

The discovery of these three mineral regions relatively close to the capital led the Viceroy Mendoza to stimulate the exploration of the mountainous regions near Mexico in the hope of finding still further rich deposits. This activity was rewarded by the revelation of the mineral region of Pachuca toward the end of 1551. With this event began the life of what,

<sup>23</sup> García, *op. cit.*, pp. 119-125; Villarello, Flores, & Robles, "Etude de la Sierra de Guanajuato," *X<sup>e</sup> Congrès Géologique International*, Fol. XV; Lucio Marmolejo, *Efemérides Guanajuatenses*, 4 vols. (Guanajuato, 1883), I, 144.

<sup>24</sup> García, *op. cit.*, pp. 133-140; Zamacois, *op. cit.*, V, 21.

with its neighbor, Real del Monte, has probably been the greatest mining camp in the world. Time after time, engineers have thought that the ore of this lode had been exhausted, but new deposits have always been found and today Real del Monte alone produces approximately one-sixth of all the silver mined in the world.<sup>25</sup> Although the mines of Pachuca attracted immediate attention, of greater contemporary importance was the invention there in 1557 of the amalgamation process for extracting silver from the ore, with the aid of mercury. While the properties of quicksilver had been known in Europe for many years, this method, invented by Bartolomé de Medina and commonly known as the patio process, revolutionized the mining industry in Mexico; by 1562 there were thirty mills of this type in Zacatecas and a decade later it had been introduced into Peru. The great importance of this process was that it permitted the profitable exploitation of ores of a much lower grade than was possible under the old method of smelting. Its value, and the credit that is due to its Mexican inventor, may be judged from the fact that it was not superseded until the invention of the cyanide process in the late nineteenth century, although gradual improvements in the technique were made from time to time.<sup>26</sup>

The next discoveries of important mineral centers resulted from the expansion and exploration northward from Zacatecas. In 1555 a small band of Spaniards established a camp at Sombrerete. According to custom, they examined the surrounding mountains in a desultory way for signs of silver but found only a few traces. One of these searchers, however, carelessly allowed his campfire to spread, with the result that a forest

<sup>25</sup> García, *op. cit.*, pp. 141-148; Miguel O. de Mendizábel, "Los Minerales de Pachuca y Real del Monte en la época Colonial," *El Trimestre Económico*, VIII, 253-309.

<sup>26</sup> For a full description of the development and technique of this process in Mexico, cf. Alejandro von Humboldt, *Ensayo Político sobre el Reyno de la Nueva España* (Sp. Trans., Paris, 1822), III, 163-193; and Gamboa, *op. cit.*, chap. xxii.

fire swept the mountain. When the ashes had cooled, it was discovered that the rock had fused in places and left a number of nuggets of silver. On further exploration, the lode was verified, and soon Sombrerete had joined the ranks of the important mineral centers.<sup>27</sup> In this same year development began of the ores of Durango,<sup>28</sup> and in 1569 Fresnillo began to produce silver.<sup>29</sup>

During the next twenty years, the convoys carrying ore from the northern mines to Mexico suffered many depredations from the Chichimeca Indians, who descended from their strongholds north of Guanajuato to attack the "Camino Real" leading to Zacatecas and the northwest. The efforts of the Viceroy Luis Velasco and Martín Enríquez to push back the Indian frontier and safeguard this road led to the next important mineral discovery — that of the rich region of San Luis Potosí. The opening of these mines was delayed until 1591, when Enríquez negotiated a treaty with the Chichimecas which permitted the government to establish colonies of Spaniards and friendly Tlaxcalans in the region.<sup>30</sup> In this same year, several hundred families settled the neighborhood of the present city and began to take silver from the Cerro de San Pedro, whose resemblance to the rich mountains of Peru caused the name, Potosí, to be added to San Luis early in the next century.<sup>31</sup>

Thus by the end of the sixteenth century most of the mineral regions of permanent significance in Mexico except in the far north had been revealed. This does not mean, of course, that

<sup>27</sup> García, *op. cit.*, pp. 155-159.

<sup>28</sup> Zamacois, *op. cit.*, V, 40.

<sup>29</sup> García, *op. cit.*, pp. 149-154.

<sup>30</sup> García, *op. cit.*, pp. 185-190; the text of this treaty is published in Lic. Primo Feliciano Velásquez, ed. *Colección de Documentos para la historia de San Luis Potosí*, 4 vols. (San Luis Potosí, 1897-1899), I, 177-183; see also Philip Wayne Powell, "Spanish Warfare against the Chichimecas in the 1570's"; *H.A.H.R.*, vol. XXIV, No. 4, pp. 579-604.

<sup>31</sup> Documents bearing on the San Pedro lode are in Velásquez, ed., *Colección de Documentos para la historia de San Luis Potosí*, pp. 226-272.

there were not later discoveries of great importance; but, for the most part, these were new mines or veins in already known districts, such as the famous Valenciana mine in Guanajuato, opened in 1767. In the eighteenth century the exploration of the northern provinces revealed new mineral districts. Catorce, to the north of San Luis Potosí, Parral in Chihuahua, Alamos in Sinaloa, and Sonora were all of importance at the end of the colonial period. The striking thing, however, is not these later discoveries — the natural result of more thorough exploration — but the fact that such a large number of the principal mining regions had been discovered and exploited before the Spanish dominion was a century old. For the purposes of this study, it is not necessary, nor with the material available is it possible, to describe in any detail the progress of the mining industry between 1600 and 1750. An examination of the figures and tables in Appendix A will show that the gold and silver production of the country increased steadily throughout these years, with the development of new mines and gradual improvements in mining and metallurgical technique.

As has been indicated, the growth of the mining industry was largely spontaneous. The part played by the government was in general a passive one consisting in the broad permission granted to search for and work mines. With the passage of time the government was forced into a closer relation with the industry. As the various *reales de minas* <sup>32</sup> grew and the number of mines increased, relations between individual owners became more complicated. Questions also arose from the inheritance and sale of mines, and the reopening of abandoned ones, all involving conflicting property claims.

Under the law of the New Code referred to above there was to be an administrator for each mining district, with exclusive

<sup>32</sup> A *real de minas* in New Spain had a meaning equivalent to that of a "mining camp" in the parlance of our own West. That is, it was a settlement, large or small, existing primarily because of the mines in its vicinity. Cf. J. Lloyd Mechem, "The Real de Minas as a Political Institution," *H.A.H.R.*, vol. VII, No. 1.



jurisdiction in mining cases.<sup>33</sup> This was the law for Spain, but, largely because of its cost, it was never put into effect in New Spain.<sup>34</sup> In practice, mining cases came under the ordinary civil jurisdiction; that is, they were heard in the first instance by the local justices, *alcaldes*, and appeals were taken to the royal audiencia in whose jurisdiction the case arose.<sup>35</sup> This subjection of mining litigation to the ordinary courts had its disadvantages, as a just decision often required that the judge have not only a sound knowledge of the law but also a practical knowledge of mining itself. Then, too, mining cases became subject to the same endless delays that were characteristic of all litigation in New Spain, causing interruptions in the working of the mines, allowing flooding of the lower levels, and reducing the royal revenue. Gamboa was conscious of these defects and the many complaints which they caused; nevertheless he favored the cognizance of mining suits by the ordinary justices and audiencias. He claimed that many intelligent and honorable men with practical experience could be found to accept judicial appointments in mining districts, while for the miners to have their own courts would not only be undesirable from the general administrative point of view, but an unnecessary burden on the industry itself.<sup>36</sup> He blamed the delays involved largely on the parties themselves and their attorneys, saying they would be just as great under a system of exclusive jurisdiction. As a remedy he suggested a more summary form of procedure before local justices acquainted with the facts, and a limitation on the attorneys and their briefs.<sup>37</sup>

Under this system the Viceroy had no part in the settlement of mining disputes; in fact by various ordinances he was explicitly prohibited from meddling in them.<sup>38</sup> He did have a

<sup>33</sup> *Recop. de Castilla*, Lib. 6, Tit. 13, Ley 9, Ord. LXXVII.

<sup>34</sup> Gamboa, *op. cit.*, chap. xxv, Secs. 1-2.

<sup>35</sup> Gamboa, *op. cit.*, chap. xxv, Sec. 5.

<sup>36</sup> *Ibid.*, Secs. 3-4.

<sup>37</sup> *Ibid.*, Sec. 2.

<sup>38</sup> *Recop. de Indias*, Lib. 4, Tit. 19, Ley 10.

certain administrative authority by virtue of his position as head of the Royal Treasury and his right to name *visitadores* or inspectors for various purposes. For example, in 1643 the Viceroy Salvatierra named Don Luis Berrio de Montalvo, Judge of the Audiencia of Mexico, as Administrator of the mines of the Kingdom, for the purpose of bringing about improvements in the refining methods in the light of new discoveries.<sup>39</sup> In addition, the Viceroys had general administrative control over the mining industry. They were specifically ordered to cause the observation of the various mining laws, to see that the mines were regularly supplied with provisions, and to encourage the search and exploitation of new mines.<sup>40</sup>

It was through this duty of assuring adequate provisions to the mines that the central government was able to exercise an influence on the mining industry most effectively. This was particularly true of the supply of quicksilver. A constant supply of this substance was essential for the refining of ore by the amalgamation process, and, as quicksilver was a royal monopoly, it brought the miners into very close relations with the government. The quicksilver monopoly formed a separate branch of the royal administration under a superintendent, usually one of the judges of the audiencia. Most of the quicksilver used in Mexico—about 5000 to 6000 quintals annually—was brought from Spain with supplementary importations from the mines of Huancavelica in Peru. The central office in Mexico or the various subtreasuries, *Cajas Reales*, supplied it to the miners at the fixed price of \$60 a quintal, f.o.b., Mexico. In the seventeenth century, this price varied, rising at times as high as \$110 a quintal. By 1700 it had become stabilized at \$60, where it remained until after the middle of the eighteenth century. Although quicksilver deposits were known in Mexico and some of the ore had been refined experi-

<sup>39</sup> Gamboa, chap. xxv, Sec. 9.

<sup>40</sup> *Recop. de Indias*, Lib. 2, Tit. 1, Ley 8; Lib. 4, Tit. 19, Ley 6, 8, 9; Lib. 4, Tit. 20, Ley 1 and 4; Lib. 8, Tit. 11, Ley 1.

mentally in the seventeenth century, the exploitation of these mines was forbidden in order not to diminish the profits of the royal mines of Almadén.

During the eighteenth century there was considerable criticism of this policy by the mining interest in New Spain. The miners believed that the high cost of quicksilver resulted in hardship to their industry. A number of the crown officials shared this feeling, believing that a cheaper supply of quicksilver would result in an increased production of silver and hence in benefits to the royal revenue. This sentiment took the form of a movement in favor of permitting the working of the quicksilver deposits in Mexico. The argument in favor of such a policy was that quicksilver could be produced much more cheaply from the mines in Mexico, and, furthermore, that the supply would not be subjected to the risks of ocean transportation and interruption in time of war.<sup>41</sup> As the crown steadfastly refused to change its policy, the miners of New Spain suggested the alternative of lowering the fixed price of quicksilver from \$60 a quintal to between \$30 to \$50. They claimed that the resulting loss to the quicksilver monopoly would be more than offset by the revenue from an increased silver production. There was discussion of these matters in pamphlet and representation throughout the first half of the eighteenth century, and in 1727 the Viceroy convened a junta which considered the whole problem and made definite recommendations to the crown embodying the points mentioned above. Although this action had no immediate results, and there was no lowering of the price of quicksilver until 1768, the subject is of importance because, as will be shown below,

<sup>41</sup> From experiments made in the seventeenth century, it was estimated that quicksilver could be produced in Mexico at about \$20 a quintal as against the \$60 charged for that from Spain. It is interesting to note, as will be shown below, that it was the interruptions caused by the Napoleonic Wars that finally caused Spain to permit the exploitation of the Mexican deposits. (As used throughout this study the sign \$ refers to Mexican or Spanish pesos of the period.)

it was largely from the action taken to resolve the whole question of the quicksilver supply that there resulted the reorganization of the mining industry in the seventies.<sup>42</sup>

Of equal importance with an adequate supply of quicksilver was the furnishing of capital for mine development. In the early days, when most of the newly discovered veins were near the surface, little capital was needed to bring a mine to the point where it paid for itself. With the passage of time the mines became deeper, and not only did the actual extraction of the ore become more expensive, but overhead and development costs rose rapidly. It must be borne in mind that few mines were worked continuously. A rich vein might be worked to a considerable depth and suddenly give out; the owner might then abandon the mine in discouragement or exhaust his fortune seeking to relocate the vein. Or, as was often the case, upon reaching a certain depth, water began to flood the workings and it became necessary to install expensive drainage machinery. If the owner could not afford this, the mine was abandoned, and any future owner was compelled to invest large sums for drainage and development work before the extraction of ore could begin. While a few individuals accumulated large fortunes with which they could afford to buy and clean up old mines, the vast majority of the miners were persons of slender means who could not themselves afford heavy investments. Hence capitalism entered the mining industry. This took several forms. In the earlier years actual working partnerships were common, where a number of individuals pooled their resources and worked the mine in common, sharing the risk as well as the profits more or less equally. These partnerships, the rights of the partners, and their responsibilities to the gov-

<sup>42</sup> For a thorough discussion of the whole quicksilver situation prior to 1760, see Gamboa, pp. 25-65. He quotes in full the acts of the Junta of 1727 and other representations. See also H. I. Priestley, *José de Gálvez: Visitor-General of New Spain, 1765-1771* (Berkeley: University of California Press, 1916); and A. P. Whitaker, *The Huancavelica Mercury Mine*, Harvard Historical Monographs XVI (Cambridge: Harvard University Press, 1941).

ernment were carefully regulated by law so as to prevent, as far as possible, disputes between the partners and interruptions in the working of the mines.<sup>43</sup>

Later on, even these working partnerships were unable to meet the heavy outlays required in many cases. To supplement them, other forms of financing grew up. As the risks inherent in mining discouraged individuals with capital from investing it directly in mines, either personally or through partnerships, various systems were worked out to furnish mining capital at less risk to the investor. Under one of these, a loose partnership would be formed between an *aviador*, or supplier, who would furnish the capital, and a miner who would furnish the mine, management, etc. In some cases the *aviador* would furnish money, in others, tools and supplies; but in most cases the sums thus advanced formed a lien against the mine and its produce over which only the royal taxes had priority. Thus the miner had to pay his debt to the *aviador* — with interest varying according to the risk — before receiving any return himself. On the other hand, if the mine proved profitable the miner received the whole profit once his debt to the *aviador* was paid. Even though under this system the risk to the investor was less than when he put it directly into a mine as owner or part-owner, the chance of loss through misadventure or bad management was still great.

To distribute this risk still further, there grew up what were known as *Bancos de Plata*. These institutions, which reached their greatest importance in the first half of the eighteenth century, were private banks which specialized in lending money to miners. In return for these loans, the miners turned over to the bank which had financed them all the silver they produced. This was credited to their account at a discount from the legal price of silver. When the bank sold the silver to the

<sup>43</sup> Ords. XXI, XLIII-XLV of the New Code (*Recop. de Castilla*, Lib. 6, Tit. 13, Ley 9). Cf. also Gamboa, *op. cit.*, 112-143, for a full description of the rights and obligations of partners.

royal mint, it realized a profit on the transaction and in some cases considerable fortunes were made. The discount from the legal price depended on the risk involved in any particular case and on the need of the miner for capital. It is obvious that there were opportunities here for usury, and it is probable that they were not missed. In spite of these defects, this system worked fairly well as long as it lasted. But after 1750, these banks began to go out of business, through death of the owner and distribution of the capital, failure, or other causes. With ever-increasing demands for capital, this situation was one of the causes of the crisis that faced the mining industry between 1760 and 1770.<sup>44</sup>

Evidence of this crisis may be seen in the sharp drop in silver coined between 1760 and 1770,<sup>45</sup> and in the increased demands by publicists and officials that "something be done for silver" — not the last time this cry was to be heard. As it was out of this crisis that there came the reorganization of the mining industry, headed by the *Tribunal de Minería*, we must examine the situation after 1760, together with the recommendations made by various writers, in more detail than has been necessary thus far.

We may well begin the more detailed consideration of the immediate background of the *Tribunal de Minería* with the publication of Gamboa's comprehensive work in 1761. In an appendix of this book, Gamboa has a list of all the mining camps of any importance in the country with brief notes as to their condition at that time. He lists in all some one hundred and six mining districts. Of these only twenty-nine were reported to be in anything like steady operation or production; in twenty-three other districts a few mines were being worked

<sup>44</sup> The above paragraphs on the financing of mines are based principally on Secs. 14-16 of Lassaga's and Velásquez de León's "Representación" of 1774 (cf. below, p. 41), supplemented by Gamboa, chap. vii.

<sup>45</sup> See Appendix I; the sharp rise beginning in 1769 was due to the coming in of the Valenciana bonanza rather than any general improvement in the industry.

with doubtful results, while the mines of fifty-four districts were said to be almost totally abandoned or unworked. Many of these abandoned districts were formerly rich, but due to flooding, depth, or cave-ins had been abandoned when no capital was available to rehabilitate them. More important even than the actual number of unproductive districts was the fact that included in this number were many of the most important centers. The following quotations are typical as illustrating the decay in once prosperous regions:

FRESNILLO. A town and mining district formerly abundant, but now fallen into decay. . .

GUANAJUATO. A populous city and mining district of very permanent produce, sixty leagues WNW of Mexico. It has been extremely rich, although now decayed, from the depth of the mines and the prevalence of the water. . .<sup>46</sup>

SAN LUIS POTOSÍ. A large town and mining district, producing silver with a proportion of gold. The mines are in the Cerro de San Pedro Potosí, at five leagues distance from the town. Although they contain no water, and would be worth working, they remain completely unworked for want of supplies. . .

SOMBRERETE. Mines formerly rich, but now flooded with water and but little worked. . .

ZACATECAS. A populous city, distinguished by having in its environs three mining districts, which have in former times been very rich, although not now worked on account of the depth of the mines, and the influx of water.<sup>47</sup>

Of the older mining districts, virtually the only important ones which were flourishing at this time were Bolaños and the Pachuca-Real del Monte region.<sup>48</sup> A few mines were being worked in Taxco, Temascaltepec, Sultepec, and some other reals, but these regions could not be called prosperous. It was in the relatively new discoveries in the North, Alamos, Sonora,

<sup>46</sup> It should be noted that the Valenciana mine had not yet come in at this time.

<sup>47</sup> Gamboa, chap. xxviii, *passim*.

<sup>48</sup> Within a few years Real del Monte was virtually paralyzed by labor troubles.

Chihuahua, etc., where the mines had not yet reached a great depth, that there was the least decline.

Naturally Gamboa and other persons interested in the prosperity of mining were not oblivious to these conditions or their implications. As can be seen from the instances quoted above, the depth of the mines and the influx of water were the principal causes of their abandonment. This clearly indicated a lack of capital as the principal factor in preventing their exploitation. Conscious of this condition, Gamboa devoted a large section to the discussion of a project for forming a general company to supply capital to mines.<sup>49</sup> Up to this time most of the capital for mining came from private sources, either individual *aviadores* or the *Bancos de Plata*. Never sufficient to furnish a supply of capital equal to the demand, these sources had become even more inadequate during the fifties when the number of such banks had been reduced to one.<sup>50</sup>

The idea of a general mine-supplying company to meet this deficiency was not new. In 1743 one Don Domingo Reborato y Solar proposed a scheme for a company with a capital of two million pesos to exploit mines within a radius of a hundred and fifty leagues of Mexico, particularly those abandoned for lack of capital. Although the plan appeared to be well conceived and received the approval of the crown together with a number of special privileges, it was never put into operation, apparently due to the opposition of the few remaining private *Bancos de Plata*.<sup>51</sup> Although fruitless, the plan did serve a purpose as it aroused discussion of the advantages and disadvantages of such a company. Furthermore, it served as the basis for Gamboa's suggestions in this regard — themselves of great value.

<sup>49</sup> Gamboa, chap. vii, especially pp. 143-181.

<sup>50</sup> Gamboa, p. 161, Sec. 87.

<sup>51</sup> The detailed history of this project is given in Gamboa, *op. cit.*, pp. 143-159.



Before going on to these, mention should be made of a company that actually was organized to rehabilitate the mines of Zacatecas and which operated between 1759 and 1765. The tribulations of this company indicate the confusion which it was hoped to correct by centralizing the industry under the *Tribunal de Minería*. The company, called "Nuestra Señora de Guadalupe," was formally organized at Zacatecas, April 15, 1759.<sup>52</sup> The instrument of organization described the decay of the mines of Zacatecas and stated that in order to remedy the situation the owners of fourteen mines had assigned their claims to the company. The shares were fixed at \$1200 each and were subject to assessment if at any time the capital should not be sufficient. The executive officer was to be a treasurer with full power to act, but accountable to and removable by the shareholders. It was proposed to put the company under the special protection of the Viceroy and to ask that all disputes be subject to his exclusive jurisdiction. Fourteen persons signed these articles of agreement, each subscribing for two shares, and provision was made for the admission of additional shareholders. The organization impresses one as businesslike, responsible, and conservative, with adequate provision for proper supervision, building up of reserves, and accountability.

Unlike many other ephemeral enterprises of the kind, this company went beyond a mere formal project. On April 20, 1759 — five days after the above instrument was drawn up — the company made its formal denouncement of the mines it expected to operate. Both the denouncement of the mines and the plan of organization of the company received the prompt approval of the local authorities and the Viceroy. With official backing, mines of proven worth, and sufficient capital for their rehabilitation, the prospects for success of the venture were bright.

By the end of 1762, however, it was evident that the affairs

<sup>52</sup> The history of this company is recounted in documents appearing in *A.G. Minería*, vol. 104 b, ff. 1-245.

of the company were not prospering. The shareholders had already been assessed for an amount equal to their original investment, and a second assessment had become necessary if operations were to continue. The credit of the company was exhausted and a shortage of laborers had forced a suspension of operations. The stockholders were unwilling to put in further money and it appeared that the company would have to give up. As a temporary expedient the treasurer agreed to carry on for four weeks at his own expense to see if this would tide over the labor shortage. In making his report of this meeting to the Viceroy, the Corregidor, Arisoarena y Lanz, foresaw little chance of improvement within the four weeks and feared the early extinction of the company. Having done all he could, officially and unofficially, he urged the Viceroy to take such action as he might deem best.<sup>53</sup>

After this crisis, the company apparently struggled on for a number of years gradually abandoning some of its mines. Since under the mining law any mine left unworked for a period of more than four months could be denounced by any person, it was inevitable that someone should eventually claim these unworked mines of the company. The matter finally arose in the summer of 1765. In June of that year, José Antonio de Zeballos, one of the original shareholders in the company, denounced before the Corregidor in his own name one of the mines included in the general denouncement of the company. This official admitted the denouncement subject to confirmation by the Viceroy. The attorney for the company immediately protested vigorously against this action. He argued that the Corregidor had no right to entertain the denouncement, as at the formation of the company, all matters involving it had been exempted from local jurisdiction and placed under the exclusive jurisdiction of the Viceroy. The Corregidor, in reporting to the Viceroy, claimed that the mine in question had been abandoned for longer than the statutory four months

<sup>53</sup> The report of this meeting is in *A.G. Minería*, vol. 104 b, ff. 215-217.

and that under the law he was bound to admit the denouncement.<sup>54</sup> The Fiscal entirely upheld the action of the Corregidor. Quoting several specific royal orders, he said that mining cases were definitely put under the jurisdiction of the local justices, with appeal to the Audiencia, and that the Viceroy was specifically forbidden to take cognizance of any such cases.<sup>55</sup> This decision, which in effect made it possible for anyone to denounce before the local justices any of the mines of the company not actually worked, apparently spelled the finish of the enterprise, as we have no further record of it.

Of more importance than the actual history of the company are the lessons it illustrates. We see first that even this group was unable to furnish a sufficient and steady supply of capital to develop the mines to the point of profitable operation. Private individuals, even though associated in a company, were easily discouraged and lost their whole investment when a slight further risk might perhaps have saved the enterprise. Then, too, there was confusion over jurisdiction. The company had its own internal organization and regulations — which it had no means of enforcing — and also was bound to come in contact with the civil officials. With no exclusive mining jurisdiction, there were always chances of misunderstanding, and reversals of rulings — such as the example we have just seen. This discouraged private companies from making long-range commitments and tended to leave the field to the slender resources of individuals.

With the example of this and other similar companies before him, Gamboa proposed a plan designed to remove the causes of failure. He considered that the main, and inevitable, reasons for the failure of private companies were the want of reso-

<sup>54</sup> In connection with the about-face on the privileges of the company, it should be noted that both the Corregidor in Zacatecas and the Viceroy in Mexico had changed since 1759. Also the arrival of the Visitador Gálvez may have served to promote a stricter adherence to the law.

<sup>55</sup> The documents on this final controversy are in *A.G. Minería*, vol. 104 b, ff. 242-245.

lution on the part of the directors, lack of confidence in the chances of success on the part of outsiders, and destructive litigation between the shareholders and the management.<sup>56</sup> To remove these obstacles, he believed it essential to put the business of supplying capital to mines under some public authority. After eliminating various other agencies, Gamboa came to the conclusion that the *Consulado*, or Commercial Guild, alone was fitted to administer a fund for the rehabilitation of the mining industry.<sup>57</sup> He pointed out that over a long period of time the Consulado had justified the confidence of the nation by its honest and efficient management of commercial affairs. He suggested that if the fund were put under the management of this body, there would be no difficulty in securing ample capital for the development of mines — from the classes which had it to invest but which would not risk it in private companies.

Gamboa then gave in detail his plan of organization for such a general mine-supplying company — to be administered by the directors of the Consulado.<sup>58</sup> It is not necessary here to examine these articles individually, but simply to point out the most important features. The company was to have an authorized capital of four million pesos and have the right to supply funds to mines or work them on its own account anywhere in New Spain. The management of the company was to be vested exclusively in the directors of the *Consulado de Comercio* of Mexico. These directors should have exclusive jurisdiction in all the financial relations of the company with its shareholders or with the miners to whom money or supplies should be advanced, but jurisdiction in all ordinary mining matters, such as the registry of mines and suits over possession or boundaries, was to remain in the hands of the ordinary justices. To

<sup>56</sup> Gamboa, *op. cit.*, pp. 166–167.

<sup>57</sup> For the reasons for eliminating other possible agencies, see Gamboa, *loc. cit.*

<sup>58</sup> *Ibid.*, pp. 171–181.

guarantee the interest on the capital fund until profits should begin, the company was to receive the privilege of an additional *real per marc* on the silver which should be entered at the mint from the mines which it supplied or worked on its own account. This point is important as it was the settlement of this question of a guarantee of interest that eventually made possible the *Fondo Dotal* of the *Tribunal de Minería*.

While the plan projected by Gamboa was never put into practice, it is noteworthy as paving the way for the later organization. We see here for the first time the suggestion that the supply of capital to the mining industry be put under the control of a semi-public agency. It is the first practical suggestion that the mining industry be considered an integral body and not a mere agglomeration of individuals. And, although the final result went beyond the suggestions made here, there is an attempt to settle the problems of conflicting jurisdiction and some assured return on the capital invested.

During these years the Spanish government was not oblivious to the low estate of the mining industry which was arousing the concern of both practical miners and men of affairs in Mexico. The decline in the production of gold and silver was immediately reflected in a loss of revenue to the crown and hence a matter of first importance to the King's ministers. It is clear that one of the motives for sending José de Gálvez to New Spain on his historic *visita* of 1765 was the restoration of the prosperity of the mining industry. In the instruction of March 16, 1765, Patiño advised Gálvez that "promotion of mining, collection of mining revenues, and provision of quicksilver and other supplies to the miners were to receive his particular attention."<sup>59</sup>

Certainly in the year 1765 no more fortunate choice for the miners of New Spain could have been made than the appointment of José de Gálvez as Visitor-General. As Priestley says, "the interest of Gálvez in the development of the mining indus-

<sup>59</sup> Priestley, *José de Gálvez*, p. 125.

try and all that pertained to it was little less than a passion, since it was to this industry that the home government still looked as the most profitable source of income.”<sup>60</sup> As we have seen, Gálvez arrived in Mexico at a most opportune time to give expression to this interest. Throughout his years in Mexico, Gálvez picked up a vast amount of firsthand information concerning the mining industry and its problems, both through his studies in the capital of the Real Hacienda and his extensive travels through the mining centers of the North. What he learned on the spot, coupled with his steady recognition of the importance of the industry, not only produced a number of immediate benefits, but led him during his visit to encourage the formation of a new mining body and subsequently, as Minister of the Indies, to give his active and sympathetic support to the establishment of the *Tribunal de Minería*.<sup>61</sup>

One of the first benefits which accrued to the mining industry as a result of Gálvez's visit was the lowering of the price of quicksilver by 25 per cent in March of 1768. This concession is indicative both of Gálvez's vision and of the growing realization on the part of the crown of the necessity of doing something for mining. The results of this action more than justified the predictions of those who had been urging it for many years. The loss to the Royal Treasury of the 25 per cent on quicksilver was balanced by an increase in the total amount of this product bought by the miners and by increased receipts from the taxes on gold and silver. So favorably impressed by these results was Gálvez that he recommended that the crown consider carefully the possibility of a second 25 per cent reduction in the price of quicksilver.<sup>62</sup>

<sup>60</sup> *Ibid.*, p. 321.

<sup>61</sup> *Ibid.*, pp. 74-75; while recognizing fully Gálvez's important contributions to the establishment of the Tribunal and the Mining Ordinances of 1783, I cannot agree with Priestley in implying that the initiative came from him alone. Evidence of the part played by the miners of New Spain themselves will appear in the pages that follow, and especially in the "Representation" of Lassaga and Velásquez de León of 1774.

<sup>62</sup> *Informe General del Marqués de Sonora* (1771), pp. 65-66. In the three

Before passing on to the more important results of Gálvez's interest and the efforts of the local mining fraternity, mention may be made of one other event of these years which not only forced itself upon Gálvez's attention but indicated clearly to the new Viceroy Bucareli, upon his arrival in 1771, the need of reform in the mining industry.

In 1766 the rich mines belonging to the Conde de Regla in Pachuca and Real del Monte were beset by labor troubles. Increasing in violence, these disorders resulted in the death of the local alcalde, a near escape for the count himself, and the virtual abandonment of the mines for a number of years. These disturbances were an outgrowth of the system of paying laborers in the mines, common throughout the country at this time. Under this system the miners received a fixed wage for a minimum quantity of ore extracted in a day, this minimum depending on the hardness of the rock and other local factors. For any ore mined in excess of this minimum, the miner did not receive a wage, but instead half the ore so mined. It is clear that under this plan the miner's reward depended both on his energy and the grade of the ore. About 1766, the managers in Pachuca claimed that the workers were taking to themselves all the rich ore and leaving for the owner only the poorer part of that extracted in any given day. To remedy this abuse an inspection system was set up whereby each worker's total was checked at the end of the day, and one of the foremen supervised the division. As they were no longer able to procure for themselves the best ore, the workers immediately objected to this inspection system, and when it was enforced the general uprising followed.

This naturally caused the Viceroy to take action, as, aside from the violent disorders and outrages throughout the region,

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years succeeding the lowering of the price of quicksilver (1768-1770), the average annual value of gold and silver coined in Mexico increased by over three and a half million pesos (cf. appendix). Not all this increase can be credited to the lower price of quicksilver as the bonanza of the Valenciana mine must be taken into account.

the closing of these rich mines was bound to have a serious effect upon the royal revenue. Hence troops were sent to Pachuca, and Francisco de Gamboa was appointed a commissioner to investigate and draw up special ordinances for the working of these mines to keep them going until permanent reforms could be accomplished. This Gamboa did in 1766, providing for the abolition of the *Partida* or share system for overtime pay, and strict regulations to guarantee order among the workers. These measures had little effect; the disorders continued and the Conde de Regla remained in seclusion at his mountain hacienda of San Miguel Regla, afraid to venture the reopening of the mines.

Both the personal prominence of the Conde de Regla and the richness of the mines affected served to keep public attention focused on this affair. A new commissioner Pedro Josef de Leoz, was appointed in 1770; his report, dated June 11, 1770, made recommendations differing from those of Gamboa, and appended the accompanying table showing the unfortunate state of affairs.

So serious was the situation that the Inspector-General Gálvez, intervened personally in the affair, rendering a detailed

STATE OF THE MINES OF PACHUCA, ETC.<sup>63</sup>

	Minas que se trabajan conforme a las Ordenanzas	Minas que están en desague	Minas que se trabajan a Ingenio	Minas que se hallan paradas	Minas que están desi- ertas	T O T A L E S
Pachuca	..	..	5	..	40	45
Real del Monte	5	3	12	8	15	43
Atotonilco El Chico	1	..	6	..	38	46
Total	6	3	23	8	93	133

<sup>63</sup> Although forming a part of Commissioner Leoz's report of 1770, this table is, through carelessness, bound in with that of Gálvez of 1771 at f. 436, of *A.G. Minería*, vol. 148 (cf. next footnote).



report with recommendations, but even this failed to settle the matter immediately. Hence the situation was still critical when the great Viceroy, Bucareli, assumed office in September 1771. Forced by this crisis into immediate contact with the mining industry and its ever-increasing problems, it was natural that Bucareli should provide a vigorous leadership in the discussion of desirable reforms.<sup>64</sup>

<sup>64</sup> Most of the numerous documents bearing on this incident are to be found collected in *A.G. Minería*, vol. 148, expedientes 3 and 4. The "Bando" issued in 1766 promulgating Gamboa's recommendations is at ff. 387-400; the second commissioner's report of 1770 at ff. 327-362; two reports of Gálvez (1771) at ff. 401-439. The whole incident is best recounted and explained in a report of Bucareli to the King, via the Council of the Indies, dated December 24, 1771, and found in *A.G. Virreyes*, Ser. I, Bucareli, 1771-1773, vol. 6/6, No. 12, ff. 10-28. The situation in Pachuca is also summarized briefly in *Informe General del Marqués de Sonora*, pp. 71-74. Mendizábel, "Los Minerales de Pachuca y Real del Monte," *loc. cit.*, gives an excellent account of this entire labor dispute, its causes and history. He feels that the efforts of the authorities to settle it were handicapped by a tendency on the part of Gamboa, Leoz, Arucho, and Gálvez to look at the problem from Regla's point of view, ignoring social and economic injustices to the miners. He credits final settlement to Bucareli's wisdom and moderation.

## CHAPTER II

### THE ORGANIZATION OF THE *CUERPO DE MINERIA*, 1770-1777, AND THE MINING ORDINANCES OF 1783

WE HAVE SEEN in the previous chapter the general background of events and conditions leading up to the organization of the mining industry in the years 1771 to 1778. In this chapter we shall examine the successive steps in this process and the structure which resulted therefrom.

The observations of Gálvez on mining made during his long visit in New Spain, summarized in his "Informe General" of 1771, offer an appropriate introduction to this period. The first subject he discussed was quicksilver — particularly the benefits arising from the reduction in the price in 1768;<sup>1</sup> following this, he recommended a reduction in the *quinto*, or royal tax on silver and gold, from the existing one-tenth to one-fifteenth, pointing out that the lowering of the price of quicksilver was of no benefit to the hundreds of small mines whose product was refined by smelting.<sup>2</sup> Gálvez also recommended abolition of the double seigniorage fee collected on silver. At that time one *real* was collected on each marc of silver at the time it was brought to the subtreasuries to pay the quinto; another real was collected when the bullion entered the mint for coinage, as well as the actual cost of minting. Gálvez believed the King had intended to collect only one real and recommended that the miners be relieved of the burden of the extra real.<sup>3</sup>

<sup>1</sup> *Informe General del Marqués de Sonora*, pp. 65-66; this has already been mentioned above, p. 23.

<sup>2</sup> *Ibid.*, p. 67.

<sup>3</sup> *Ibid.*, pp. 68-69; this question of seigniorage and coinage fees was quite complicated and technical; we will return to it later in this chapter. The most comprehensive treatment of the whole subject is in Fausto de Elhuyar, *Indagaciones sobre la Amonedación en Nueva España* (Madrid, 1818); see also H. I.

Finally, the Visitor-General made certain observations and recommendations of a more general nature concerning the organization of the industry. Coming from such a source, these may well have supplied much of the impetus which set in motion the machinery of reform. Gálvez wrote in his report:

From the information I have obtained from the reports of persons most intelligent in mining, and the practical knowledge I have been able to acquire in the mining camps themselves on my extended travels, I have projected a new Ordinance for the organization of this important branch; which I will present to His Majesty, with an accompanying report of the grave prejudice which results to the Royal Treasury and to the public interests of the nation from [the fact] that the miners of this Kingdom, and the others of the two Americas, are without rules which constitute them in privileged bodies, like the commercial Guilds, and which are adaptable to the condition of the countries and difference of the times.<sup>4</sup>

He then summarized the misfortunes afflicting the mining industry — abuse at the hands of the ordinary courts, losses because of unregulated workers, and inability to finance development of new and the rehabilitation of old mines — and concluded his observations as follows:

In view of these defects, and many others which I have noticed with much sympathy and close examination, I consider indispensable and most useful a new Ordinance which should regulate the mining industry of these West Indies (*sic*) on all points on which the old one, formed for the Kingdoms of Spain, cannot be adapted, and on some others which were not touched on in that [Ordinance] because in that epoch experience had not yet indicated them; and it seems to me that if Commerce, being in truth the second act which puts in motion the wealth drawn from the mines — the primary source which produces it — has its own private jurisdiction in economic and mercantile affairs and enjoys the privilege that its members may unite

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Priestley, *José de Gálvez, Visitor-General of New Spain* (Berkeley: University of California Press, 1916), pp. 314-321.

<sup>4</sup> *Informe del Marqués de Sonora*, p. 70. It is just possible that the "accompanying report" referred to in this paragraph may have been a preliminary draft of Lassaga's and Velásquez de León's "Representation" of 1774.

in Guilds, with even greater reason should the mining interest obtain equal prerogatives, considering that it provides the state and private persons with the metals in which is fixed the price of all the articles of sale and commerce.<sup>5</sup>

Although there are some further observations on the troubled situation in Pachuca, this concluded the more general recommendations of Gálvez in his "Informe General." While the initiative in pushing reforms in New Spain itself was now assumed by the new Viceroy, Antonio María de Bucareli y Ursua, Gálvez continued to play a most important role. His "Informe General" brought the situation to the attention of the crown, while during most of the time when the subsequent reforms were being effected, he held the post of Minister of the Indies, where his interest in mining and personal experience with conditions in New Spain made him a valuable friend of the mining fraternity.

Bucareli assumed office in September 1771, and, because of Gálvez's report, the situation in Pachuca, and demands on the part of the miners for help, he was immediately forced to give serious attention to the mining industry.<sup>6</sup> Being a conscientious official, Bucareli decided that the first step in any reform program he might initiate was to inform himself in detail of the condition of the industry in all parts of the country. Therefore he determined to have a complete mining census of the country made as quickly as possible. As this survey constituted one of the earliest and most complete economic censuses in Mexico, it is desirable to take it up in some detail.<sup>7</sup>

<sup>5</sup> *Ibid.*, pp. 70-71; see also Priestley, *José de Gálvez*, pp. 74-75.

<sup>6</sup> Gálvez, *op. cit.*, pp. 70-71; see also Priestley, *José de Gálvez*, pp. 74-75.

<sup>7</sup> It is worth mentioning that in 1771-72 there was another attempt to form a private company to finance mines — this time the new mines of Sonora. Like most of its predecessors this project was stillborn; it is outlined in a dispatch of Croix, dated April 27, 1771 (*A.G. Virreyes*, Ser. II, vol. 4:14, Croix 1770-71, No. 883, ff. 203-204). Bucareli's comments on the failure of the project are in a dispatch of Mar. 23, 1792 (*A.G. Virreyes*, Ser. I, vol. 5:5, Oct. 27, 1772; *A.G. Virreyes*, Ser. II, vol. 14:31, Bucareli 1772, No. 614, ff. 40-41). Nothing further was heard of this company after this.

<sup>7</sup> It may be of interest to note that during the winter of 1934, when the price of silver was rising, two persons used data supplied them by the writer

On July 1, 1772, Bucareli wrote to the *Oficiales Reales* of the various provincial subtreasuries as follows:

In order to procure information as to the state of the mining industry in the Kingdom, and to be able to dictate those measures which may seem proper for its development and functioning, I hereby give general instructions to all *oficiales reales* of the respective *Cajas* to forward to me with the greatest possible speed, a detailed account of the number of mines which are worked; noting their condition, growth or decay, name of the owners to whom the title belongs, the development of which they are capable, the number of marcs they produce annually according to the records of the respective *Cajas* either by the amount of quicksilver used or by the record of quintos.

Likewise let them make note of the number of mines which having been worked productively (in the past) are today abandoned, whether it be because of the inability of the owners to develop them, or because of the ore running out; and of those which, having recently been denounced, are either just beginning to be worked after coming into the possession of the denouncers, or are suspended because of the small resources of their owners. Your Excellencies should illustrate these notices with all those observations which your practical experience has indicated to you as most suitable to sustain the Brotherhood of Miners — which is that which maintains the flow of commerce, develops the Kingdom, and increases the just dues of the King; giving me immediate advice of the receipt of this order, and that measures are being taken for its fulfillment.<sup>8</sup>

The replies of the various *oficiales reales* were naturally of uneven value — depending largely on the zeal and ability of the local officials. From a survey of all these replies extending from 1772 to 1774, we may, however, form a fairly accurate picture of the state of mining in Mexico at this time. For the sake of convenience, these replies will be taken up in the order in which they were received.

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from this census to aid in identifying lost and abandoned mines in the State of Mexico.

<sup>8</sup> The above is a translation of the copy sent to the *oficiales reales* of Guana-juato, and found in *A.G. Mineria*, vol. 11, f. 4.

Pachuca was the first district to render its report, and not only was this the first in point of time but the best from the point of view of information supplied and intelligent observation.<sup>9</sup> The various parts of this report gave complete information as to each mine in the district, both those in operation and those which had been abandoned. There were a total of thirty-five mines in the former category and one hundred sixteen in the latter. The report also indicated the approximate production of the active mines and the capital necessary to rehabilitate the abandoned ones.

Of more interest are the general observations and recommendations included in the covering letter from the *oficiales reales*. They gave three principal reasons for the abandonment of so many mines: namely, the death of the owners and the unwillingness of the heirs to continue in the speculative business of mining; the improvidence of miners who failed to build up reserves in times of bonanza; and, of greatest importance, the flooding of mines, necessitating expenditures beyond the resources of the owners. The principal means which these officials recommended to meet the situation followed the suggestion of Gamboa for a company under the management of the Consulado. They felt that the resources of individuals were insufficient for the task and that only some semi-public agency could raise the necessary capital.

The next report, in point of time, came from Parral — far to the north, in the present State of Chihuahua. This presented a contrast to that of Pachuca. The general report stated that conditions were better at that time (1772) than twenty years earlier, with many mines in operation which were formerly abandoned. Perhaps because of this prosperous condition the report is less informative or interesting than that of Pachuca.<sup>10</sup> It states, however, that in spite of the apparently prosperous condition many of the mines reported as in operation were pro-

<sup>9</sup> This report is in *A.G. Minería*, vol. 11, ff. 260-273.

<sup>10</sup> This report is in *A.G. Minería*, vol. 11, ff. 248-258.

ducing very little silver because the slender resources of the owners permitted very little development work.

Turning from Parral, we come to the report of another of the northern provinces — that of Durango. Like its predecessors, this takes up the various mines individually giving the required data on each one. This information shows that in the twenty-eight *reales de minas* included in this jurisdiction, there were one hundred fifty-one mines in operation and sixty-five abandoned.<sup>11</sup> The general report and the interpretive observations which accompany these facts are, however, far less encouraging. As this document seems to sum up the troubles and suggestions not only of this district, but of most of the others, it is given here in full.

#### DURANGO — 1772

The most common causes for which certain mines are abandoned are principally the lack of capital for development, low grade ore, scarcity of labourers, the abundance of water in their levels, hardness (of rock), the intemperance of certain climates, lack of supplies, and the small amount of metals extracted which makes their refining too expensive and which holds back capitalists from the aid and habilitation of the miners; more so because of the experience which they have of the prodigality and lack of economy of these latter; and the prejudices which many of the mine suppliers have suffered from these disorders, to which may be added the propension of the labourers to robbery, laziness, and all the other vices; from this it results that the miners can never attain security in times of bonanza (but continue to suffer) just as many hardships as they (always) have; and that those of this profession who have accumulated large fortunes for their retirement are very rare; on the contrary, there are many more who live weighed down with their debts and burdens under the necessity, in order to maintain their business, of seeking backers with the sacrifice of heavy premiums, by which means for the most part, they are further retarded; and the backers either lose their capital or are delayed a long time in the collection of their interest; from which it has come about that private capitalists have been filled with a terror and repugnance so great that they resist and

<sup>11</sup> *A.G. Minería*, vol. 11, f. 246.

oppose invincibly the undertaking of any new project, notwithstanding the fact that they are generally very lucrative, and that the miners have made themselves so mistrusted as far as advancing them capital is concerned, notwithstanding the fact that it cannot be denied that the mining industry causes the trades and all other professions to flourish, gives increase to the Royal Treasury and encourages every class of business and exchange.

Other grave defects and ones which are worthy of the greatest attention may be noticed in most of the mining districts of this Kingdom; such as, that their mines are worked with notorious disorder and transgression of the mining Ordinances, which prescribe the order, method and rules with which they should be operated — because of which some collapse and others are destroyed, others are flooded, and most of them are caved in and impossible to work; from which results the abandonment and total depopulation of many of them, because any new development would be much more costly; these deeply rooted defects arise from the owners themselves who only take advantage of the richness of the metals, paying little or no attention to working them in accordance with the royal ordinances; this applies to (mainly) those who, with little knowledge, work mines and call themselves miners, because it cannot be denied that some districts are maintained and worked with good order and regularity; the remedy for these damages, so serious to the whole mining industry, can only be found if Your Excellency charges all Justices of the Mining Districts with the most explicit orders to require, in their respective districts, the punctual observance and fulfillment of the legal dispositions which the Mining Ordinances provide as to the denouncement, registry, possession, labour, and development of the mines, without permitting in any way that their literal observance be abused or altered, visiting them each year (or each six months if it be deemed useful and convenient) without taking any taxes from the miners because of this or even less imposing any undue contributions upon them; this is the provision which at present we judge the most opportune and efficacious for the repair and correction of the above-mentioned defects, to the end that old mines may be repaired . . . and new ones developed . . . in conformity with the Ordinances . . .

The improvement of which the miners may be capable as to the working and benefit of the mines and the means of providing this aid to the mining industry, which, among other details, Your Excellency asks us in your above Order, has been the object of the greatest at-



tention and zeal of his Majesty and the Viceroy of this New Spain, as at the present it is of the lofty zeal of Your Excellency with which tirelessly you aspire to make flourish by the proper measures this industry and to make happy the Kingdom; the best and most efficacious measure which it needs for its breathing and nourishment in the midst of the well-known decadence in which it finds itself and in order to bring itself to a happier state, is capital for the purchase of equipment and material and the payment of labourers and for quicksilver, and the cost of drainage, shafts, tunnels and other dead works which many of the formerly rich mines need in order that they may be enabled to render the ores which remain in their levels and veins, and to work the many hidden ones which there are in these vast domains; to which end among others an attempt was made in the year 1750 by His Excellency, the Count of Revillagigedo, in consequence of an Order of His Majesty to found and establish a company to supply mines with a capital fund accumulated by the assignment of shares of five hundred pesos each after the example of the rich companies of Holland, England and France, and even of our own Spain where in consequence of the Royal Order of the twenty-third of December, 1739, there was formed a company of a hundred shareholders for the working of the mines of copper and lead of Atáun, Durango, and Carranza in the Lordship of Biscay and the Province of Guipuzcoa, and he ordered that there should be given to the public, a prospectus urging people to enter it; and following out this praiseworthy idea, His Excellency, the Marqués de Croix, in the last year of his government urged the formation and establishment of another Company of Sinaloa and Sonora, by another printed proclamation which ordered that public notice should be given and under whose high impulse we solicited stockholders who should enter it; but the zealous intentions of both their Excellencies were frustrated by the lack of subjects who would come in to form the first funds because of the common terror and repugnance which merchants and every class of capitalists have of mixing themselves in these affairs even though it should not be doubted that they are most lucrative and interesting for private persons and the public; in which regard and in that of this being the most advantageous and adaptable measure if it be the superior will of Your Excellency, you should be pleased to apply those measures of Your Vice-Regal authority to the end that it may have effective success.<sup>12</sup>

<sup>12</sup> *A.G. Minería*, vol. II, ff. 152b-155.

Except that in the older districts conditions were even worse, with more mines abandoned and more flooded, the above may well be taken as a general statement of the mining conditions in Mexico at this time. We may note particularly the emphasis put on the lack of capital and the unwillingness of private persons to supply it, the prodigality of the miners, and their failure to abide by the existing mining ordinances, as causes of the sad state of affairs.

The next report was that of San Luis Potosí, which is of little general value.<sup>13</sup> This report listed forty-four mines in active operation, forty-five running part time, and eighty-seven abandoned. Besides the usual lack of capital, a shortage of laborers was given as one of the causes for the depressed condition.

The report from Zacatecas and Fresnillo indicated that these centers, once among the most productive in the country, had fallen to a very low estate during the preceding forty years. The summary at the end of this report disclosed the condition in 1773:

ZACATECAS: 32 mines being worked; 528 abandoned; 2000 prospect tunnels.

FRESNILLO: 50 mines in operation and 100 abandoned.<sup>14</sup>

In addition to a factual recitation of the details concerning each mine, this report had an extensive diagnosis of the causes of the depression and recommendations for its cure. These are of interest mainly because of their agreement with the observations contained in the reports of other regions.<sup>15</sup>

The next report came from Sonora — a relatively new mining district far to the north. This report, although incomplete, showed a much more prosperous condition than in the other centers. This was to be expected in a new region where the mines had not yet reached a great depth. Nevertheless, the

<sup>13</sup> *Ibid.*, ff. 156-158, 188-190.

<sup>14</sup> *Ibid.*, f. 135.

<sup>15</sup> *Ibid.*, ff. 125-134.

miners were handicapped by the sparseness of the population, Indian troubles, and labor difficulties.<sup>16</sup>

The information from Guadalajara was also incomplete, covering nine reals in this district. The summary of their returns showed a total of fifty-nine mines in operation and thirty abandoned — a remarkably good showing for one of the older districts. Unfavorable factors were said to be low-grade ore in the deeper levels, and the high price of the salts used in refining this type of ore.<sup>17</sup>

The report from Guanajuato — one of the most important of all mining centers — was rather unsatisfactory for our purposes. The *oficiales reales* displayed a shocking ignorance of mining affairs, drawing sharp criticism from the Viceroy. They sought information from the *Diputados de Minería* of the various *reales*, and the result was that while complete information was furnished as to the scores of individual mines, there was no integrated report of a general nature. The summary showed sixty-three mines in operation, forty on a part-time basis, and seventy-seven abandoned.<sup>18</sup>

The reports from Bolaños, Sombrerete, and the district of Zimapán showed the familiar condition of the great majority of mines abandoned because of lack of capital.<sup>19</sup>

The final report covered the district subject to the *Caxa Real de México*, and was not sent in until April 28, 1774.<sup>20</sup> As this described in detail eleven separate *Reales de Minas*, some of them, such as Taxco, Sultepec, and Zacualpán, of considerable importance, it is a lengthy document, but the conditions were summarized in the accompanying table.

The comments on the various *reales* tell the usual story. Speaking of Taxco, for example, the report said that there were

<sup>16</sup> *Ibid.*, ff. 119-120.

<sup>17</sup> *Ibid.*, ff. 96-100.

<sup>18</sup> *Ibid.*, expediente No. 1. For a description of the *Diputadas de Minería* and their duties, see footnote no. 22 below.

<sup>19</sup> *Ibid.*, ff. 49-84, 291, 285.

<sup>20</sup> *Ibid.*, f. 285.

forty-seven mines being worked and three hundred fifteen "abandoned for lack of capital and development."<sup>21</sup>

What was the picture of the mining industry as a whole presented to Bucareli by these reports? The facts concerning in-

## CAXA DE MÉXICO

	Minas en corriente	a m. <sup>a</sup> lavor	aban- don <sup>a</sup>	Catas	Marcos de Plata marcados
Tasco . . . . .	47		171		
Sultepeque . . . . .	24	7	14		
Zaqualpan . . . . .	17	4	20	1.000	
Tetela del Rio . . . . .	6	2	15		
Quautla de Amilpas . . . .	6	2	16		
Tetela de Jonotla . . . .	1		8		
Curucupaseo . . . . .	2				
Cadereita . . . . .	8				
Chautla de la Sal . . . .	2				
Sichu de S. <sup>n</sup> Luis de la Paz	7	2	7	.	
	120	17	266	1.000	

dividual mines and the numbers abandoned seem to bear out the observations of Gálvez and others over the past ten years on the low estate of the industry. They confirm the accuracy of the subsequent statement of Lassaga and Velásquez de León in their Representation of 1774 that, with few exceptions, it was only the newer mining districts that could be called prosperous, with most of the older districts reporting a large proportion of their mines abandoned. The unanimity with which this condition was ascribed to lack of capital is noteworthy. There is no such agreement as to other causes of the depression. In some districts labor troubles are blamed, in others the price of salt and quicksilver, while in many we have references to a failure to abide by the ordinances. Likewise Bucareli could not fail to have been impressed by the many com-

<sup>21</sup> *Ibid.*, f. 310.

ments on the wastefulness and prodigality of the miners, and, in many cases, by the ignorance of the royal officials of the mining conditions in their provinces.

Toward the end of 1773 the first positive step was taken as a result of the agitation which had been going on for some years, and which, by means of the reports of Gálvez, Croix, and Bucareli, had reached the Court in Spain. On November 12, 1773, the King issued a cedula which, after reciting the tenor of various dispatches from Croix and Bucareli concerning the hardships suffered by small miners from the system of distributing quicksilver, instructed the Viceroy to convene immediately a junta consisting of the Administrator of the quicksilver monopoly, the Superintendent of the Mint, the Fiscal of the Audiencia, the Treasury officials of Mexico, *diputados generales del Cuerpo de Minería*, and other informed persons. In order that the junta might not be too unwieldy, the Viceroy was ordered not to summon the mining deputies from all the districts, but only the most important, with the understanding that these deputies represent the whole mining industry. While they were to attend the junta, make suggestions, and give advice, these deputies were not to have a vote on the decisions. The junta was to consider first whether distribution of quicksilver at retail by the mining deputies would offer advantages to the small miners. It was also instructed to study the price of quicksilver and determine the lowest point to which it could be reduced with benefit to the mining industry and the Treasury. It was the last paragraph of this order which was the most important: ". . . And likewise His Majesty wishes . . . that in the Ordinances which Your Excellency shall draw up for the mining (industry), you shall organize and establish it in a formal and united body, on the model of the Consulates of Commerce, in order that in this way its individuals may achieve the permanence, encouragement, and aid which they lack."<sup>22</sup>

<sup>22</sup> A.G. Cédulas, vol. 103, No. 127; the *Diputados de Minería* as they existed

This order produced results with a speed remarkable in Spanish administration. Bucareli received it on February 16, 1774; a note written on it ordered that all material bearing on the subject be immediately collected and that the junta of officials designated begin its sittings at once, meeting Tuesdays and Fridays at four P.M. until the business should be concluded. Three days later the Viceroy sent a letter to the *Diputaciones de Minería* of the most important districts, informing them of the royal order and its contents, and commanding them to appoint well-informed delegates to attend the junta and present the views of the mining industry; these delegates were to report within two months and be prepared to stay indefinitely.<sup>23</sup> On the same day a similar letter was sent to the *oficiales reales* of the various provincial subtreasuries ordering them to propose matters to be discussed by the junta.<sup>24</sup>

Considering the difficulties in communications, the various mining centers acted promptly, and replies began to come in about April 6th. Durango wrote that it was choosing a delegate, but asked whether Parral and Chihuahua should not be represented. Bucareli replied that the delegate from Durango could represent them also, under the proper instructions.<sup>25</sup> Bolaños requested permission to appoint a resident of Mexico to represent its interests as it could not afford the expense of sending one; the request was granted and Don Juan Lucas de Las-saga was named.<sup>26</sup> Sultepec appointed Don Joaquín Velásquez de León.<sup>27</sup> The others followed suit, until, on April 18th, the

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before 1777 appear to have been similar to the honorary *regidores*; they were chosen biennially by the active mine owners to represent the mining industry in the local municipal council and protect its interests, but had no jurisdiction or executive authority; some light is thrown on them by documents describing a disputed election in Zimapan in 1770, *A.G. Minería*, vol. 127, exp. No. 1; cf. also Bancroft, *History of Mexico*, III, 522. The important Cédula of November 12, 1773 shows the unmistakable influence of Gálvez, who may well have been its actual author.

<sup>23</sup> *A.G. Minería*, vol. 48, ff. 493-496.

<sup>24</sup> *Ibid.*, f. 416.

<sup>25</sup> *A.G. Minería*, vol. 58, f. 382.

<sup>26</sup> *A.G. Minería*, vol. 58, ff. 384, 388.

<sup>27</sup> *Ibid.*, f. 386.

delegates of the various districts requested that they be allowed to present their powers and be admitted to the junta. This petition was signed by the following delegates: Juan Lucas de Lassaga for Bolaños, Marcelo de Ansa for Zacatecas, Manuel Ximénez for Guanajuato, Antonio de Villanueva for Taxco, and Joaquín Velásquez de León for Sultepec.<sup>28</sup>

The views of the mining industry on the current situation and its suggestions for reform were most clearly expressed in a representation which the delegates of Bolaños and Sultepec, Lassaga and Velásquez de León, laid before this junta.<sup>29</sup> Dated February 25, 1774, this was probably handed to the other members of the junta soon after all the delegates had assembled. Inasmuch as it laid the foundation for the whole future organization of the *Cuerpo de Minería*, this document deserves careful attention.

It described first the importance of the mining industry to the life of the country and the low estate to which it had fallen in recent years. The conditions depicted and their causes were the same with which we have become familiar in the preceding pages, only they were presented with more emphasis and clarity. Like earlier writers, they concluded that the principal handicap of the industry was the lack of capital. Beyond this Lassaga and Velásquez de León felt that the confusion within the *Cuerpo de Minería* and in the administration of the mining laws could be charged with considerable responsibility. They pointed out that in New Spain there was no agency specifically responsible for the mining industry and the administration of

<sup>28</sup> *Ibid.*, ff. 390-391; it is curious that no delegate appears for Pachuca; one may have arrived later although there is no evidence of this; possibly this was due to the troubled conditions there.

<sup>29</sup> *Representación que a nombre de la Minería de esta Nueva España hacen al Rey Nuestro Señor los Apoderados de ella, D. Juan Lucas de Lassaga y D. Joaquín Velásquez de León*; this document bears the imprint, "impresa en México por D. Felipe de Zúñiga y Ontiveras — Año de 1774"; a copy of this is in *A.G. Virreyes*, Ser. II, vol. 59; another copy is in *A.I.*, Sec. 5, Aud. de Méx., Legajo 2240; the original, signed by Lassaga and Velásquez de León, is in *A.G. Minería*, vol. 11, ff. 359-442.

its laws, comparable to the Administrator-General in Spain. In addition the ordinances were out of date and, having been framed for Spain, were in many ways unsuited to conditions in America. Hence the authors concluded that there must be some special mining jurisdiction in New Spain corresponding to the Administrator-General and subadministrators in the mother country; although they felt that modern times and local conditions required a different system from that of Spain.

They next directed their attention to the subject of the training of mining engineers. Written at a time when technical schools, or even the teaching of applied engineering, were still many years in the future in the United States, their observations are significant. They stated first that the art of managing a mine was one of great difficulty demanding expert knowledge and much experience; while the science of ore-reduction or metallurgy demanded even more knowledge. After mentioning the schools of Mineralogy and Metallurgy, for which Austria, Prussia, Saxony, and Sweden had long been famous, the authors charged that in America the art and science of mining and metallurgy were only learned by imitation and blind following of tradition. The self-styled experts were only able to function because there was none of superior training and knowledge to expose their ignorance. Meanwhile, they proceeded not by science, but by guess, and defrauded the mine-owners and the public of large sums.

Having described the current state of the industry, Lassaga and Velásquez de León proceeded to give their specific recommendations for its reform.<sup>30</sup> They first offered their solution for the problem of supplying capital to mines. After showing that experience had proven that miners could not depend on outside private capital because of most investors' mistrust of mining, they discussed Gamboa's suggestion of a general company under the management of the Consulado. They approved

<sup>30</sup> These recommendations are embodied in Sections 35-68 of the *Representación*.



the principle of such a semi-public company, but did not favor its control by merchants, as they felt that it was of vital importance for the directors of any such fund to have a thorough practical knowledge and experience of mining. They pointed out the number of past projects which had failed because of a poor choice of mines and unintelligent management and expressed the belief that if a general fund were administered by merchants unfamiliar with mining it would encounter similar difficulties and fail to inspire the confidence of investors.<sup>31</sup> The conclusion was reached that the capital for such a fund should come from the miners themselves and be administered by miners. They realized that the latter could not afford to contribute directly or pay any additional taxes and suggested a definite plan to meet the situation and overcome all difficulties.

To provide the necessary income to support such a fund they proposed that the King abolish the double collection of the seigniorage fee (as recommended by Gálvez) and that the real in each marc which the miners would save thereby be turned over to a *Fondo Dotal de Minería* to be administered by a Tribunal in the interests of the whole *Cuerpo de Minería*. This Tribunal, described below, would establish a *Banco de Avíos* to handle the fund. The latter would be assured an annual income of at least \$200,000 from the contribution of one real in each marc of silver produced.<sup>32</sup> With \$50,000 estimated as adequate to cover the expenses of administration and maintenance of the Tribunal and a School of Mines, there would be a clear annual income of \$150,000. They pointed out that this would be sufficient to cover the interest at 5 per cent on a capital of \$3,000,000, but felt that it would be wiser to raise only \$2,000,000, and keep the extra \$50,000 of income for emer-

<sup>31</sup> In view of the later record of the Tribunal (of which the authors were members) in this particular, this objection to the Consulado has rather a grim irony.

<sup>32</sup> This was based on an estimated annual silver production of \$12,000,000, which the table in Appendix A shows to have been conservative.

gencies or the accumulation of a surplus. This capital would be used to finance mines (as explained below), and it was felt that the increased production resulting from this stimulus would provide the Tribunal with an income sufficient to carry a much larger capital. They argued that there would be no difficulty in borrowing the capital from individuals, private and religious corporations, once it was understood that the interest was guaranteed by the assured income of the Tribunal.<sup>33</sup> The scheme appeared to be sound, providing the King would agree to relinquish the extra real seigniorage and turn it over to the Tribunal.

The supply of capital was not the only factor which these writers considered necessary for a revival of mining. They deemed it of prime importance that the whole industry be organized as a formal integrated body with a *Tribunal de Minería* as its head. They recommended that the latter be composed of an administrator-general and two deputies-general, together with a fiscal and attorney. The director of the College, mentioned below, should also sit with the Tribunal on financial and economic matters, and there would be a factor to act as manager of the *Banco de Avíos*, and keep accounts. They suggested that at first the administrator and deputies-general should be named for life, or a term of ten or fifteen years, in order to get the organization well established; but afterwards the members of the Tribunal should be elected every three years by a *Junta General de Minería* composed of delegates from all the mining districts. All these officials should be mineowners of wide practical experience. The Tribunal thus formed would be the administrative head of the whole industry, as well as acting as a board of directors of the bank and as a court of appeal, or of first instance in important cases,

<sup>33</sup> As we shall see in the course of this work, they were approximately correct in their estimate of the Tribunal's income and in their prediction of its ability to borrow capital; they were sadly mistaken in their prophecies of the results of its activities in financing mines.

in mining litigation.<sup>84</sup> Furthermore, they urged that each *Real de Minas* elect two mining deputies — as they were already supposed to do — and that both the elections and activities of these officials be regularized and given more importance, as in the future they would be the points of contact between the Tribunal and the individual mining centers.

The authors next took up the need for mining education. The necessary training, they believed, could be best accomplished by establishing a School of Mines. At the head of this school there should be a director — “A man learned in Mathematics and experimental Physics, in Chemistry and Metallurgy, and thoroughly instructed in the practical mining of New Spain.”<sup>85</sup> There should also be four professors, one of mathematics, one of physics, one of theoretical and applied chemistry, and one of mineralogy and metallurgy; likewise, there should be a drawing master. All these and the director should be secular persons, and the instruction should be in Spanish extending over a period of four years. Twenty-five scholarships should be established to provide maintenance for the sons of poor Spanish or noble Indian miners, and the instruction should be free for them and any others who might wish to attend by the day or pay their own board. Adequate machinery should be set up near by to provide practical experience for the students of mineralogy, metallurgy, and mechanics, while during vacations the professors should take the students on field trips to Pachuca or other near-by centers to afford them an opportunity of entering mines and seeing them actually at work. After completing the four years’ course in the School, every student should go to some mining district designated by the Tribunal for two years’ practical experience in mining and metallurgy; here he would be maintained by the Tribunal and under the direction of the local mining deputies.

<sup>84</sup> Mining cases would be heard in first instance by the two local *Diputados de Minería* and the *Juez Real* — *Representación*, Sec. 57.

<sup>85</sup> *Representación*, Sec. 63.

At the close of the two years the latter would render a report as to the student's diligence and ability. He would then return to the School for a general examination on both practice and theory, and if successful would receive a degree. When the supply of graduates should become sufficient, the Tribunal should require that all mineowners employ only persons holding degrees from the School as mining or metallurgical engineers.

The next two sections of the representation gave briefly the suggested salaries for the members and staff of the Tribunal and School, together with other estimated expenses, amounting in all to \$50,000.<sup>36</sup> After providing for the training of qualified engineers and the expenses of the Tribunal and School, the authors returned to the subject of the Bank and suggested the procedure by which capital should be supplied to mines.<sup>37</sup> They recommended that after application by a mineowner for a loan, the Tribunal should, with the aid of a competent engineer, make a thorough investigation of the mine. If it should determine that the project offered good possibilities, a contract should be drawn up between the Tribunal and the owner specifying the terms and method of payment and the security which the bank should have. The authors admitted that there might be losses from these loans, but claimed that, under the centralized control of the bank and with a careful preliminary survey in each case, there would be much less chance of loss than in the past. Furthermore, in most cases it would be the owner and not the bank that would sustain the loss. Even if worst came to worst, and all the capital were lost, they stated that it could be repaid with interest in twenty years out of the income from the real per marc of all silver coined. The representation closed by emphasizing the improvement in the condition of mining, the increased production of gold and silver, and the benefits to the whole country which would result if these suggestions were carried out.

<sup>36</sup> Sections 64-65.

<sup>37</sup> *Ibid.*, Secs. 66-68.

While no immediate action was taken upon this document, it laid the foundation for the subsequent organization of the *Tribunal de Minería*, and its two authors played the leading part in drawing up the permanent Mining Ordinances of 1783. Clearly, this whole scheme depended on the King's conceding to the mining industry the extra real then being collected as seigniorage. Without this assured income, there would be no funds to pay the expenses of the Tribunal and School or provide the interest on the capital raised by the bank.

Leaving these recommendations for the present, we must now return to the junta itself. On April 18, 1774, the delegates from the various mining districts had presented their credentials and asked to be admitted to the junta. This body met on the 3d of May and immediately began to organize the work. The first meeting considered and approved a plan which authorized the *Diputaciones de Minería* to distribute quicksilver to poor miners at cost in quantities as small as one-fourth of an *arroba*, instead of their being compelled to buy it by the quintal from the quicksilver monopoly. The junta next considered how it should divide the other matters before it and in what order they should be taken up. All the questions resolved themselves into three general topics: (1) the ultimate price which should be determined for quicksilver; (2) the formation of new mining ordinances; and (3) the organization of the mining industry into a unified body along the lines of the *Consulado de Comercio*. The junta decided to take up this last topic first as the other two could be more readily settled once this organization was effected. At this point, Lassaga and Velásquez de León laid their representation before the junta, which voted to furnish a copy to each of the members and give him an opportunity of studying the document before discussing it at a later meeting. The first meeting of the junta then adjourned.<sup>38</sup>

<sup>38</sup> All the above information is in a letter from Bucareli to Arriaga dated May 27, 1774, *A.G. Virreyes*, II, vol. 37:54, No. 1397; under cover of another letter of the same date, No. 1396, Bucareli forwarded the reports from the

After this we have no further information as to the activities of the junta for several months except some rather contentious correspondence concerning the reimbursement of the delegates for their expenses in Mexico.<sup>39</sup> From succeeding documents, we may assume that this time was largely spent in the study of the Representation. On August 17, 1774, the delegates of the different *reals* listed above signed an affidavit setting forth that they were the duly authorized representatives of the most important *Reales de Minas* in the country, and, as implied in the royal order of November 12, 1773, represented the whole body of miners; as such, they subscribed without qualification to the Representation of Lassaga and Velásquez de León, and requested the Viceroy to give the recommendations contained therein the attention they deserved as the most important matter pending before the junta.<sup>40</sup>

Soon after this Bucareli sent the Representation to Spain with a covering letter.<sup>41</sup> The first part of his letter concerns the method of taxing gold and silver not coined but used in the arts. This matter apparently had been discussed by the junta and it was decided both by the *Junta de Minería* and the *Junta*

various mining districts covered in the first part of this chapter. These dispatches as well as that of Feb. 16 (above) were acknowledged and the actions of the Viceroy and junta concerning quicksilver approved in a royal order of Oct. 12, 1774 (*A.G. Cédulas*, vol. 105, No. 96). This order ends by saying that there should be expressed to the *Diputados de Minería* the satisfaction of the King at the "order, moderation, and prudence of their pretensions"—presumably referring to the Representation. Bucareli forwarded this document to Lassaga and Velásquez de León (apparently the only members of the junta remaining in Mexico) on Mar 1, 1775 (*A.G. Minería*, vol 47, expediente No 5, Doc. No. 1). These latter replied on March 12, expressing their appreciation of the King's action concerning quicksilver and his praise of the junta;—and stated that as they agreed that there was no need of reconvening the junta at this time, they were informing all the *Reales de Minas* of His Majesty's graciousness (*ibid.*, Doc No. 2).

<sup>39</sup> *A.G. Minería*, vol. 113, ff. 377-397.

<sup>40</sup> *A.G. Minería*, vol. 113, f. 352. This Representation received further wholehearted endorsement in a letter from the *Diputación de Minería*, of San Luis Potosí, dated Dec. 6, 1774, appearing in ff. 355-356 of this volume.

<sup>41</sup> Bucareli to Arriaga, Mexico, Sept. 24, 1774, *A.G. Virreyes*, Ser. II, vol. 41/58, No. 1534.

*de Hacienda* that such metals should not pay the seigniorage fees but instead certain taxes by weight.

Bucareli next discussed the question of double seigniorage — raised by Gálvez and discussed so fully in the Representation. As this matter was the key to the reforms suggested by Las-saga and Velásquez de León, it will be useful to quote this clear exposition of it:

The second important point was also urged by the Visitor General when, having been ordered to inform himself on the foregoing point of the taxes on jewelry and ornaments, he expressed the opinion that in accord with the spirit of the Laws, the seigniorage dues on gold and silver bullion ought not to be paid until the money is coined for the account of the King in these dominions . . .

In the old plant in which were established the offices of the Mint, the silver brokers <sup>42</sup> coined (the money) through the Treasurer and the seigniorage dues were collected there until, at the request of the Treasurer, it was ordered by a royal cedula of June 23, 1683, that they should be exacted in the sub-treasuries of the Kingdom. And when in the year 1732 the function (of coinage) was incorporated in the Crown, and gold and silver began to be bought, and money coined, for the account of the Royal Treasury, it resulted that from that time the Mint exacted the seigniorage after the *oficiales reales* had already collected it in their respective sub-treasuries.

This double payment is manifest in the accounts of the Royal Treasury: the miners have complained of it; the superintendent of the Mint and the Fiscal profess and admit it, and it admits of no doubt as a notorious fact, and it has now been so represented by the representatives of the *Cuerpo de Minería* in the enclosed printed (document) without any cause or foundation for this double exaction being found except the activity of the officials in levying it and the acquiescence of the miners in paying it.

Notwithstanding this, . . . it seemed proper to the *Junta de Hacienda* to await the decision of His Majesty, whom it behooves to determine the just value of his royal taxes and the weight of the arguments deduced by the *Cuerpo de Minería*, . . . <sup>43</sup>

<sup>42</sup> "Banqueros de Plata." Cf. above re Bancos de Plata.

<sup>43</sup> Bucareli to Arriaga, Mexico, Sept. 24, 1774, *A.G. Virreyes*, Ser. II, vol. 41/58, No. 1534.

This explanation showed clearly the working and injustice of the double tax and indicated the Viceroy's belief that it should be discontinued. Hence, on this point the miners had gained a powerful ally. In the next part of this report their pretensions did not fare so well. In this the Viceroy commented on the Representation itself, summing up in a sentence the general proposals — organization of a guild like the *Consulado*, the *Banco de Avíos*, the School of Mines, and the formation of new Ordinances. He declared that in the opinion of his government and of many experienced individuals the objections to this vast scheme were insuperable, and that they deemed the project in itself and all its parts impracticable and contrary to the public interest. Furthermore, he pointed out that all these ideas depended on the diversion of the \$200,000 double seigniorage to the miners to defray the costs of the Tribunal and provide interest on a capital of several million pesos. He considered it futile and presumptuous to reach any conclusions on the scheme as a whole until the King had finally reached a decision regarding the seigniorage. Even if the King should decide to abandon this double taxation, there were other difficulties to be overcome, to wit:

whether in such a case it would be better that all the miners of the Kingdom should be free of this tax than that they should continue paying it for ends that would not redound to the benefit of all, but of the few whose mines were supplied with capital; whether it would be feasible to create this guild from among subjects so dispersed and scattered over the vast extent of the whole kingdom and who are known to be essentially individualistic, or would it be more practicable that the *Consulado de Comercio* and the merchants who usually supply capital to miners should take charge of these funds and of the rehabilitation of flooded and other mines . . .<sup>44</sup>

He objected further that the raising of capital for the bank would withdraw from circulation money needed by commerce, and opposed any further lowering of the price of quicksilver.

<sup>44</sup> *Ibid.*



The Viceroy ended his dispatch by saying that inasmuch as these matters needed long and careful consideration, he would suspend the *Juntas de Minería* for the present, awaiting instructions from the King. This he apparently did as there is no further information on the subject for over a year.<sup>45</sup>

After the lull during 1775, there was a resumption of activity in the early months of 1776, probably as a result of the appointment of José de Gálvez as Minister of the Indies. During the spring he instructed Bucareli to hasten the formation of the new ordinances, commended the value of the census reports, and urged that he try to effect, without prejudice to the general reorganization of the mining industry and its ordinances, the formation of a company of shareholders to finance mines lacking in capital.<sup>46</sup> This indicated that whatever general provisions were under consideration, hope was still held that private capital could be induced to enter the mining field.

In the meantime the Council of the Indies had had the Representation of 1774 and the whole seigniorage question under consideration and had reached a decision on April 23d.<sup>47</sup> The action of the Council was embodied in a royal cedula dated July 1, 1776,<sup>48</sup> which Bucareli forwarded to Lassaga and Velásquez de León, as representatives of the *Cuerpo de Minería*, on October 5, 1776, in the following terms:

By Royal Cedula dated in Madrid the first of July of this year, the King has been pleased, among other things to resolve the following:

"And in order that the important Community of Miners may erect itself into a formal body, like the Commercial Guilds of my dominions, for which I give them all my Royal consent and permission, I

<sup>45</sup> Bucareli's doubts as to the practicability of the plan were reinforced by a report on it rendered by Don Domingo Valcarcel, senior judge of the Audiencia and Superintendent of Quicksilver. The latter attacked the whole project on typically legalistic grounds. (*A.G. Minería*, vol. 58, ff. 345 *et seq.*)

<sup>46</sup> Gálvez to Bucareli, Mar. 22, 1775. *A.G. Minería*, vol. 57, exp. No. 1, Doc. No. 3. Gálvez to Bucareli, Apr. 24, 1776. *A.G. Cédulas*, vol. 107, No. 288.

<sup>47</sup> *Acuerdo del Consejo de Indias*, Apr. 23, 1776. *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2240.

<sup>48</sup> *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2236, exp. 2.

concede them the faculty of levying on their silver half of the two-thirds (parts) of the double seigniorage tax which formerly was paid to me, and of which I declare them free under the terms expressed."

This notice I communicate to your excellencies as Representatives of the *Cuerpo de Minería* in order that, while the necessary measures are being taken for its fulfillment, you may communicate it to the Deputation of the reals of the Kingdom, with the object of not delaying their satisfaction, and so that by renewed labour they may demonstrate their appreciation of the favour with which His Majesty aids them, and his constant zeal for that which may be of service.<sup>49</sup>

This was the first concrete step toward the goal for which the mining fraternity had been striving. There were many details yet to be worked out and objectives to be gained, but the two fundamental principles had been established, that is, the right of the miners to create a formal organization modeled after the Consulado, implying at least a certain degree of self-government in their own affairs; and their right to support this organization by collecting for their own benefit at least a part of the seigniorage dues heretofore unjustly collected by the crown. With this evidence of the royal favor, the miners' representatives could now increase their own efforts with more confidence in the final result.

Soon after this important dispatch was received in Mexico, various meetings of treasury and other officials were held to discuss the best means of carrying out the orders so as to protect the Treasury and prevent fraud or the evasion of proper taxes. It was decided that gold and silver intended for coinage should pay the seigniorage fee at the Mint upon being entered there, while bullion intended for jewelry or the arts should pay the fee in the provincial subtreasury offices. At the same time, the superintendent of the Mint raised certain questions about the collection of the two-thirds of a real for benefit of the miners. The miners' representatives asked that the King be requested to clarify these matters and for the present it was

<sup>49</sup> A.G. *Minería*, vol. 47, exp. 1, Doc. No. 5.

agreed to let the Mint collect this impost and hold it until a decision was reached.<sup>50</sup>

In the meantime, Gálvez had written expressing the hope that, since the seigniorage question had been settled, the organization of the *Cuerpo de Minería* and the formation of new ordinances would proceed rapidly. He also ordered a further reduction in the price of quicksilver equal to that of 1768, and instructed the Viceroy to devise means of reducing the burdens on silver refined by smelting, so as to provide benefits commensurate with those accruing to the miners who used quicksilver.<sup>51</sup> The Viceroy forwarded a copy of Gálvez's dispatch to the representatives of the miners, instructing them to redouble their activity in carrying out its instructions and to work out some equitable way of compensating those miners who did not use quicksilver for the benefits received by those who did.<sup>52</sup>

Meanwhile the actual organization of the *Cuerpo de Minería* by its representatives was in progress. On March 18, 1777, Velásquez de León wrote Bucareli that after the preliminary juntas of 1774 the representatives of the other *reales de minas* had gone home, leaving powers with Lassaga and himself to conduct the preliminary negotiations with the government. In view of recent developments they felt that the presence of all the delegates was once more necessary and had written them to return to Mexico or send substitutes.<sup>53</sup> From this and the documents below, it seems clear that sometime during the later part of March 1777, the delegates from the various *reales de minas* all arrived and held preliminary meetings. On April 18, 1777, they addressed a formal petition to the Viceroy, citing

<sup>50</sup> All of the above is included in a dispatch from Bucareli to Gálvez dated Jan. 27, 1777, *A.G. Virreyes*, Ser. II, vol. 70/87, No. 2730.

<sup>51</sup> Gálvez to Bucareli, Oct. 4, 1776, *A.G., Reales Cédulas*, vol. 109, No. 11.

<sup>52</sup> *A.G. Minería*, vol. 47, exp. No. 6, Doc. No. 1.

<sup>53</sup> *Expediente sobre formación del Tribunal de la Minería de este Reyno*, *A.G. Minería*, vol. 60, exp. No. 5, f. 103 (a "Testimonio" is in *A.I., Sec. 5, Aud. de Méx.*, Leg. 2240).

the authorizations of the King and the powers they held from the various *reales de minas* and requesting permission "to proceed immediately to form the *Cuerpo* and elect those subjects who are to compose the Tribunal which should govern it . . ." <sup>54</sup>

Bucareli granted his permission a month later and the actual organization was accomplished at a formal meeting of the various delegates held on May 24, 1777, and recorded in a long instrument entitled the *Acta de Erección*.<sup>55</sup> The account began with the names and titles of the delegates present and then cited the Royal Orders and Cédulas leading up to this meeting. It stated, without apparent justification, that not only had His Majesty consented to formal organization of the *Cuerpo de Minería*, but also

to the formation of a special Tribunal composed of miners, with all the necessary jurisdiction to promote and consider all administrative and economic matters affecting said important body, and to try and determine all suits and special or contentious cases which arise among miners, and concern them, and about mining matters, all in view of the "*Representaciones de la Minería de este Reyno*" . . . which were presented to His Majesty by the Viceroy . . .<sup>56</sup> to which end, in the first place there were presented and caused to be read before anything else, the above mentioned Royal Cédulas and Orders of His Majesty and the matters concerning the said Representations. The second matter was that, in conformity with the contents of said documents presented to His Majesty and seen by his Royal Council, . . .

<sup>54</sup> *Ibid.*, ff. 100-101b; the delegates who signed this were:

*TAXCO* — Don Antonio de Barrio (substitute for Don Pedro de Anza)

*PACHUCA* — Don José de la Torre Calderón (substitute for Don Ignacio Tomás de Mimíaza)

*GUANAJUATO* — Don Tomás de Liciaga

*BOLANOS* — Don Joaquín Velásquez de León and Don Juan Lucas de Lassaga

*ZACATECAS* — Don Marcelo de Anza

*ZULTEPEC* — Don Joaquín Velásquez de León

<sup>55</sup> *A.G. Minería*, vol. 60, exp. 5, ff. 104-110.

<sup>56</sup> The assertion of authority to exercise all these powers seems to be based on the assumption that in approving parts of the "Representation" (re seigniorage, etc.) the King had approved all its pretensions, rather than on any specific authorization up to this time.

they had to elect a subject who, with the title of Administrator General, which is given him by Art. 77 of the Ordinances of Mines contained in Lib. 6, Tit. 13, Ley 9 of the New Collection, shall be the President and head of said Tribunal; another who, with the title of Director General of the *Cuerpo de Minería*, shall have the "universal knowledge necessary to enlighten its members, direct and promote all that which may concern it, and shall attend the Tribunal and have a voice and vote in all the administrative and economic affairs of said *Cuerpo*, but not in suits and contentious judgments." And finally three others who, in the capacity of Deputies General, with the said Administrator shall have voice and vote in the hearing and determination of every class of business, suits and cases pertaining to the same *Cuerpo de Minería* and private miners; and these are the members who shall compose the said Tribunal, which, having been formed should proceed immediately to name two subjects satisfactory to it, one as legal counsel, the other as secretary or clerk . . .

Certain qualifications that all these officials should have were then described — probity, piety, education, good birth, judgment, age, and, particularly, "ability and intelligence in the mining of this Kingdom acquired by sufficient time in the practical and experimental knowledge of it." The delegates then decided that in accordance with the plan of the Representation it should only be necessary for two of the Deputies to meet with the Administrator-General for the transaction of all ordinary business, the deputies taking turns for this purpose. They further provided that in cases of particular importance or difficulty the Tribunal could seek advice from the persons best qualified by knowledge and practical experience, and a list of persons qualified to act as such *consultores* was drawn up and filed for the future use of the Tribunal.

Next, after asking the blessing of Our Lady of Guadalupe, the meeting proceeded to the election, by secret ballot, of the various persons who should compose the Tribunal, with the following results:

ADMINISTRATOR GENERAL. Don Juan Lucas de Lassaga — 5 votes  
DIRECTOR GENERAL. Don Joaquín Velásquez de León — 5 votes

DEPUTIES GENERAL. Don Julián de Hierro — 5 votes  
Col. Tomás de Liceaga — 4 votes  
Don Marcelo de Anza — 4 votes

The choice of the *consultores* mentioned above was left to the Tribunal. The delegates then took an oath of obedience to the Tribunal, in the names of their respective districts and of the whole community of miners which they represented; and transferred to the Tribunal all the rights, powers, and faculties which had been entrusted to them to further the interests of mining, direct the affairs of the industry, and administer justice in mining cases.

The junta also voted that the officials elected should immediately enjoy the salaries specified in the Representation, to be paid out of the Mining Fund held in the Mint and derived from the proceeds of the former double seigniorage; and likewise that these officials should have "ample, general, and also special faculty and power as far as should be necessary in a free and general administration so that they may now at all times dispose of said funds in the form and manner which may seem to them best suited to the accomplishment of its purpose, expressed in said printed Representation."<sup>57</sup> The members of the newly elected Tribunal agreed that, without prejudice to their right to name an assessor, for the present the director, Velásquez de León, should exercise the functions of this office. The meeting closed with the election of the clerk of the junta, Don Mariano Buenaventura de Arroyo, as secretary of the Tribunal, with instructions to forward a copy of this *Acta* as well as one of the Representation to the Viceroy that they might be formally approved and published.

Before taking up the next steps in the formation of the Tribunal, we may well pause and comment briefly on the broader implications of the junta and its work. In the first place, it was significant from a political point of view. In the

<sup>57</sup> In the light of future developments, this was a most unwise authorization.

midst of a system where virtually all authority, both political and economic, emanated from the crown, the most important industry in the country established itself as a self-governing community within the body politic. As developed more completely in the Ordinances, authority in this body, in theory at least, came from below rather than from above — that is, its form of government was representative and, at least to a certain extent, democratic, rather than based on the orders of an absolute authority above and administered through appointees responsible only to that authority. Of course, its sanction came from the crown, and its existence could be terminated at any moment by the King; but the significance is that the initiative came largely from below and the direct management of the enterprise was in the hands of elected representatives of the group concerned. From the manner in which these relatively extensive privileges and responsibilities were exercised, as described in the later chapters of this study, we may learn something as to the readiness of the Mexicans for self-government — although any conclusions must be drawn with great caution as the *Tribunal de Minería* had limited authority and never was an entirely free agent. The action of the junta also gives certain indications as to the future of the Tribunal itself. One is impressed, as in the Representation of 1774, by the practical, realistic approach to the problem as compared with the medieval legalism of so many Spanish administrative policies. The purpose seems to have been to set up machinery that would really serve the mining industry in a progressive manner, be elastic enough to adapt itself to change, and treat all the angles of its government — economic, judicial, administrative, etc. — as interrelated and not as merely isolated phenomena. On the other hand, certain weaknesses in the fabric were evident even at this time. The first is the fact that the members of the junta elected themselves as the officials of the Tribunal. This was, perhaps, natural as they had been the leaders of the movement for the organization of the *Cuerpo de Minería* from the first

and no doubt felt that it should start its life under the direction of its friends and those who were familiar with its purposes. One wonders, however, if it would not have given more weight to the Tribunal and been more in harmony with the representative system which was invoked in theory to have included one or two persons not so closely allied with the original group. This perhaps was the original cause of the mistrust which the *Diputaciones Territoriales* subsequently had for the Tribunal. Here also, in miniature, was a foretaste of what was to become the accepted mode of government in independent Mexico — in form a representative democracy, but in reality the hegemony of a small self-elected group. Another act of this junta which was not particularly auspicious for the future of the Tribunal was the promptness with which the members voted themselves handsome salaries to be paid from the Mining Fund. This too was typical of later Mexican governments; and, as with them, so in the case of the Tribunal, a lavish spending of the money of the members of the body led to later financial difficulties. But it is not fair to be too critical of these matters. This small group of far-sighted men had taken the leadership in the efforts to reorganize an industry in a sad state of decay, had overcome heavy odds, and finally achieved their purpose. It was natural that having given birth to this new organization, they should feel themselves the best fitted to guide its early destinies, as they probably were. In the matter of salaries, they had carried on the struggle in the interests of the mining industry for some years almost entirely at their own expense and were perhaps entitled to some reward.

On the day following the formal junta establishing the Tribunal, a copy of the Act was forwarded to the Viceroy with the request that he approve it and publish his authorization so that the Tribunal might begin to exercise its functions, subject to the King's approval.<sup>58</sup> This request, together with the Act itself, was in the usual manner submitted to the fiscal and the

<sup>58</sup> *A.G. Mineria*, vol. 60, exp. 5, f. 111.



assessor for their advice and opinions. The former recommended the approval of the Act by the Viceroy except for the part concerning the exclusive jurisdiction of the Tribunal in mining cases. He felt that inasmuch as this jurisdiction would involve the application of the new mining ordinances which the King had ordered drawn up, it would be better to wait until these ordinances were framed and approved by the King before conferring on the Tribunal its exclusive jurisdiction.<sup>59</sup>

The assessor also recommended that the Viceroy approve the action of the junta,<sup>60</sup> and on the 18th of August, a viceregal proclamation was published establishing the Tribunal and putting into force the Act. The first part of this summarized all the preliminaries of the final junta and the actions of that body, including the names of the officials elected, all of which actions were approved. This was followed by the formal authorization, in the following terms:

By virtue of which, in the name of the King, our Lord, using the superior faculties conferred on me, and in obedience to the said Royal Cedula of July 1, 1776, I approve the Act of Erection of the *Cuerpo Y Tribunal de Minería* which has been presented to me, and the election of the subjects which it contains and who are specified: declaring that this Tribunal shall enjoy and use, until His Majesty resolves that which may be his royal pleasure, all the administrative, directive, and economic powers and faculties which the Consulados of the monarchy enjoy under the law, as far as they may be adaptable, in conformity with the royal will: suspending for now only the exercise of the contentious and exclusive jurisdiction which is permitted to the said consulados of commerce, until there are formed the new ordinances which have been commanded to be drawn up and His Majesty is pleased to approve them. And in order that notice of this may come to all: I command that it be published by proclamation in this capital and in all the other cities, towns, and villages, of these domains, to the end that the said Tribunal may be given full faith and respect as any of those of the Kingdom, and obeyed by all whom it touches or may touch, under the grave penalties which those

<sup>59</sup> *Ibid.*, ff. 111b-113.

<sup>60</sup> *Ibid.*, ff. 113b-116b.

incur who are disobedient to their judges and transgress the Laws and Sovereign Orders of the King. Given in Mexico the 13th day of August, 1777.<sup>61</sup>

Notwithstanding the protests of the Tribunal at the postponement of the contentious jurisdiction, the King approved Bucareli's proclamation and the Act of Erection as limited thereby; at the same time the Tribunal was once more ordered to proceed to the formation of the new ordinances.<sup>62</sup>

The drawing up of the new mining code was in fact the first task that occupied the attention of the Tribunal. It is true that this code did not actually go into effect until 1783 and that the Tribunal performed various activities before that time. Nevertheless, it will be useful to depart from the chronological order and discuss the ordinances themselves before taking up these other matters, since the Tribunal was in reality functioning according to them before 1783. Furthermore, whatever the importance of the other activities and later history of the Tribunal, these *Ordenanzas de Minería* form its lasting monument. Not only were they extended to Guatemala, New Granada, and Peru, but they served as the basis for the mining law of independent Mexico until the latter part of the nineteenth century. Unfortunately there are no records of the Tribunal's labor in compiling these laws. The bases were undoubtedly the existing code and the Representation of 1774, while much weight was probably given to Gamboa's *Commentaries*. The Tribunal must have begun the work soon after its erection was approved by the Viceroy, as it entailed a great deal of labor and the first draft was sent to Bucareli in May 1778.<sup>63</sup>

<sup>61</sup> This is a printed document and may be found in various places — e.g., *A.G. Virreyes*, Ser. II, vol. 77/94, p. 74, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2240.

<sup>62</sup> *A.G. Virreyes*, Ser. II, vol. 77/94, No. 3164. Tribunal de Minería to Gálvez, July 27 and Sept. 25, 1777, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2240. Gálvez to Bucareli, Dec. 29, 1777, *A.G. Reales Cédulas*, vol. 112, No. 231.

<sup>63</sup> The exact date when this first draft was sent is not known, but Bucareli acknowledged its receipt on May 30, 1778, *A.G. Minería*, vol. 47, expediente 7, No. 3.

The latter apparently made some suggestions, as on June 27th Lassaga forwarded a final draft with a letter saying that some modifications had been made and this represented the final judgment of the Tribunal.<sup>64</sup> After receiving this draft the Viceroy studied it with great care and made lengthy observations on the various articles. He still had it in his possession when he died on April 9, 1779, and this together with the ensuing interregnum probably accounted for the fact that it was not sent to Spain until August 26, 1779.<sup>65</sup>

Bucareli's observations were detailed and intelligent. It is not necessary to discuss them except to say that, while he heartily endorsed the general plan, he felt that in some spheres the government should have more control. He did not favor a completely independent jurisdiction for the Tribunal, and believed that the Viceroy should have some check over financial matters. Altogether his comments were constructive and affected the details rather than the general principle of the project.

In the meantime, the audiencia had sent directly to Gálvez a representation in a very different tone, not only discussing the proposed ordinances but criticising the whole institution of the *Tribunal de Minería*.<sup>66</sup> It protested strongly against the authority granted the Tribunal and even more its pretensions to exercise contentious jurisdiction. The members of the audiencia charged that miners were not fitted to exercise judicial authority and pointed out that even the Viceroy was forbidden this activity. Furthermore, it alleged that the junta which established the Tribunal was highly irregular, not

<sup>64</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2240; the original of the draft is missing; there is a certified copy signed by Lassaga, Velásquez de León, Liceaga, and del Hierro in *A.G. Virreyes*, Ser. II, vol. 1/22, ff. 128-177.

<sup>65</sup> Mayorga to Gálvez, Aug. 26, 1779, *A.G. Virreyes*, Ser. II, vol. 1/122, No. 71; a copy of the Viceroy's observations is in this same volume at ff. 178 *et seq.*; although there is nothing to indicate it, it appears certain that these observations were the work of Bucareli and not Mayorga, as the latter had been in office only three days when he sent them off.

<sup>66</sup> This representation, dated April 26, 1778, is in *A.I., Sec. 5, Aud. de Méx.*, Leg. 2236.

representative of the mining industry, and showed its general character by electing its own members to the important positions on the Tribunal. This representation was an early indication of what was to be a never-ending feud between the audiencia and the *Tribunal de Minería*. At times some of the arguments of the former were perfectly valid, as in this case; but they always lost force because the tenor of the criticism was so destructive and because the audiencia was so obviously infuriated by its loss of the lucrative mining litigation.<sup>67</sup>

Serious consideration of the proposed ordinances by the government in Spain began on February 1, 1780, when Gálvez sent the Tribunal's draft to D. Antonio Porlier and D. Francisco Machado, *contador general* and fiscal of New Spain respectively, with orders for them to examine it carefully and make a full report of their opinions and advice. Porlier and Machado spent nearly a year going over the draft of the ordinances and all the related material. Finally they decided that the subject was so complex and of such importance that they should seek outside advice, and they felt that no one was as well qualified to give it as Gálvez himself with his extensive personal experience. The latter agreed to do what he could, and these three officials went over the whole subject in detail, discussing each paragraph of the Tribunal's draft from all angles. These meetings led to the conclusion that it would be necessary to make some changes in the draft as proposed by the Tribunal, especially in those sections dealing with the contentious jurisdiction of the Tribunal and *Diputaciones Territoriales*. In view of this decision it became necessary to redraft the whole code. This task was performed by Porlier and Machado and occupied the whole of the year 1782.<sup>68</sup>

<sup>67</sup> In addition to the representation from the audiencia as a whole, the Judges Valcarcel and Gamboa wrote very unfavorable comments on the proposed ordinances, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2240; Gamboa may well have been hurt because his ideas had not been more generally adopted.

<sup>68</sup> *Expediente sobre la formación de las Ordenanzas de Minería de Nueva España, A.I., Sec. 5, Aud. de Méx.*, Leg. 2236.

In the meantime the Tribunal was becoming impatient, and not without reason; from 1774 to 1778 the government had repeatedly urged speed in the formation of the ordinances; once the Tribunal was established it completed the draft in a little over six months, and four years had now passed since it had turned this over to the Viceroy. Hence, on March 13, 1782, the Tribunal wrote Gálvez urging that the ordinances be promulgated as promptly as possible. The miners said that this was highly important so that their own existence and activities could be organized on a regular and permanent basis, and particularly so that the question of contentious jurisdiction could be settled.<sup>69</sup> It was, however, March 26, 1783, before Porlier and Machado sent their revised draft to Gálvez. The latter then went over it carefully with the King himself. Charles III made a number of further changes and finally, on May 22, 1783, ordered that the ordinances be printed and distributed "to the dominions of both Americas and the Philippines . . ." <sup>70</sup>

Inasmuch as this code formed the charter of the Tribunal, some examination of its provisions is desirable, noting important differences between the final form and the draft of the Tribunal. The Ordinances are divided into nineteen titles, covering a wide variety of subjects, both general and particular, and of varying importance for our purposes.

Title I dealt with the Tribunal itself, its membership,

<sup>69</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2240.*

<sup>70</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2236*; this *expediente* contains the final manuscript draft with the changes made by the King written in Gálvez's hand. The ordinances have been published in various editions and are available in most of the larger libraries. There is an English translation in H. W. Halleck, *A Collection of Mining Laws of Spain and Mexico* (San Francisco: 1859), pp. 187-308. Throughout the study, I have used the original official edition printed in Madrid in 1783, each copy of which has Gálvez's Ms. "rúbrica" following his printed signature; all references are to this edition. Because of their availability, both in Spanish and English, it has not been thought necessary to take up the contents of the Ordinances in any great detail — especially the more technical parts which do not deal with the functions and duties of the Tribunal.

method of choice, and so forth. After authorizing its official title, it provided that, in accordance with the Act of Erection, the Tribunal should be composed of an administrator-general, a director-general, and three deputies-general, with the provision that the number of deputies might be reduced to two but might not be increased.<sup>71</sup> The qualifications of these officials were then specified — the same as indicated in the Act, and this was followed by their terms of office. The manuscript draft provided that the administrator and director chosen at the original junta of 1777 should hold office for life and the original deputies for fifteen years. This was changed in the final form so that while Lassaga and Velásquez de León might hold office for life, the three deputies should only continue for the regular term provided hereafter.<sup>72</sup> Articles 5 to 13 dealt with the procedure in electing the members of the Tribunal. These were to be elected by a Junta General, held every three years and composed of delegates from all the *Reales de Minas* of the country, except that to have representation a real must have "a church, a priest, a Royal Judge and Mining Deputies, six mines in operation and four smelters."<sup>73</sup> Ordinarily the administrator was to be elected for a term of six years from among those who had served as deputies, and the director for nine years. The deputies were to be elected for nine years each, one retiring each triennium. The other details of the procedure of the Junta General we need not consider here, except to say it was also to name an advisory council — twelve to be chosen at the first junta and six each triennium thereafter.<sup>74</sup> The remaining articles of this Title covered details of the internal organization and personnel of the Tribunal, and provided for annual reports to the King and representation of the Tribunal at the Court.

<sup>71</sup> *Ordenanzas*, Tit. I, Art. 2; this last provision does not appear in the manuscript draft.

<sup>72</sup> *Ibid.*, Art. 4.

<sup>73</sup> Art. 6; Art. 7 specifies the representation which certain of the larger centers are to have.

<sup>74</sup> For details, cf. Arts. 7-17.

Title II of the Ordinances turned from the central administration to the local organization in the various *Reales de Minas*. This was to consist of a *Juez de Minas* who was to be the local royal justice,<sup>75</sup> and two *Diputados de Minería*, with four alternates for the latter. These deputies and alternates were to be chosen at annual elections in which all the qualified mine owners and operators of the district should have a vote. They were to hold office for two years, one retiring each year, and the elections were to be confirmed by the Tribunal in Mexico, to which also they were to render an annual report on the condition of the mines of their district.

The next Title (III) is an extremely important one dealing with jurisdiction in mining cases. It is a long section and it will be sufficient here to outline the system established. In the first place, the Tribunal was given complete authority over all the administrative, economic, and educational aspects of the mining industry, and the provincial *Diputaciones de Minería* were ordered to subordinate themselves to its authority.<sup>76</sup>

In regard to what is called contentious jurisdiction and the decision of civil suits and causes concerning mining, a rather elaborate system was set up. Within a radius of twenty-five leagues of Mexico, all cases concerning mines, smelters, metals, money advanced to mines, and the like, were to be heard and decided in the first instance by the *Tribunal de Minería*. Outside of this radius similar jurisdiction was given to each provincial mining deputation over cases within its district. The procedure in all such cases was to be summary in form — the cases to be decided on the oral testimony of

<sup>75</sup> Art. 1; this article is not in the manuscript draft; in its place Arts. 1 and 2 of the manuscript present the desirability of judges being trained in mining matters and provide that *jueces de minas*, *Alcaldes Mayores*, and *Corregidores* of *Reales de Minas* be experienced in mining. The omission of these provisions in the Ordinances and the provision that the royal justice shall be the *Juez de Minas* are significant in showing the King's determination not to put all powers in the hands of the miners themselves.

<sup>76</sup> Tit. III, Art. 1.

the parties and their witnesses without the delays of lawyers or written briefs. It was provided that decisions of the Tribunal should be signed by the administrator and two deputies-general, even though one of them might dissent from the decision, and by the two deputies in the provinces.<sup>77</sup> Appeal was allowed only after final decision, where execution of sentence would cause great harm to the appellant, and where the sum involved exceeded \$400. Where there was no appeal, the decisions were to be put into effect immediately.

Appeal from the decisions of the Tribunal or provincial deputies was to regional courts of appeal known as *Juzgados de Alzadas*. The *Juzgado de Alzadas* of Mexico was to be composed of one judge of the audiencia designated annually by the Viceroy, the director-general of the Tribunal (who was not to sit with the Tribunal in hearing cases of first instance), and a third *Conjuez de Alzadas* elected by the *Junta General de Minería* from among those who had filled positions on the Tribunal. The court for the district of Guadalajara was to be composed of a judge of that audiencia and two "miners of probity and the other necessary qualifications," chosen every three years by the Junta General in Mexico from among residents of Guadalajara or near-by districts. The courts of appeal in other provinces were to be composed of the senior royal judge of the province and two miners who should be either members of the Advisory Council to the Tribunal or alternates for the deputies of the district where the royal judge resided.<sup>78</sup> As in the first instance, these appeals were to be heard according to a summary procedure which should aim to avoid the legalistic delays of the past and to permit an equitable decision in the shortest time possible. If these appeals confirmed the decision of the lower court, the sentence was to be final, but if there was a reversal either party could

<sup>77</sup> Arts. 2-9; if the two deputies could not agree, they were to call in one of the elected alternates, who should decide.

<sup>78</sup> Art. 13.



appeal for a third hearing before the same *Juzgado de Alzadas* temporarily enlarged by two additional associate judges named by the Tribunal from among members of the Advisory Council or alternates of deputies residing in the district. From the finding of this body, there was no further appeal, except that cases involving a value of \$20,000 or more could be carried to the Council of the Indies. In all cases, the decision was to be by a majority of the judges hearing the case.<sup>79</sup>

Following this came various provisions designed to prevent the interruption of operations in a mine that might be the object of litigation. For example, it was ordered that in the execution of a judgment all the tools and machinery should be exempt from attachment, only the products of the mine being liable to satisfy the judgment. During such periods, the court could put an interventor in charge of the mine to prevent waste and collect the amount due the other party under the award of the court.<sup>80</sup>

In criminal matters involving mines or miners, it was stipulated that minor cases should be heard by the same mining courts that had jurisdiction over civil cases with appeal to the *Juzgado de Alzadas*. But in serious cases the mining courts were simply to apprehend the culprit and bind him over to the royal judges and the criminal side of the *audiencia*. It was further provided that all cases of conflict of jurisdiction between different courts should be settled by the Viceroy.<sup>81</sup>

This Title differed considerably from the manuscript draft prepared by the Tribunal. In general, the draft gave more attention to unimportant matters of detail and neglected the broader questions of jurisdiction. In the final form, the composition and functions of the various courts were more clearly defined, and some of the enthusiasm of the Tribunal for an entirely independent jurisdiction was curbed. We cannot fail

<sup>79</sup> Arts. 17-19.

<sup>80</sup> Arts. 20-28.

<sup>81</sup> Arts. 29-31.

to be impressed, however, by the broad concessions made to the mining fraternity. All civil cases were to be heard in the first instance by courts composed of miners, and even in the courts of appeal they were to have a majority of the judges. From a government usually inclined to be legalistic, these were important favors, especially when we remember that even the well-informed Gamboa had opposed any change in the long-established system which gave lawyers — royal judges and *audiencia* — virtually the entire jurisdiction. The experience of José de Gálvez in New Spain was undoubtedly the reason why these concessions were granted. Passionately interested in the mining industry, he had ample opportunity to become familiar with the delays to which mining cases were subject in the civil courts. His experience would have been in vain without the liberal spirit of his royal master, and the King must be given credit for cutting through the red tape of legal precedent.

Titles IV through XI dealt with various technical aspects of mining law which need not detain us. Covering such matters as ownership of mining property, the size of mining claims, and regulations for the working of mineral deposits, these sections in general maintained the principles of the earlier law, but adapted them to the needs of the New World.<sup>82</sup>

Title XII treated of labor in mines. The importance of this subject justifies giving this Title somewhat more extensive consideration than the preceding ones. The first six articles dealt with the wages to be paid and the method of paying them. In general it was ordered that no wages should be reduced below the customary rate of the district, that they must be paid in currency of gold or silver (not in food), and

<sup>82</sup> Ultimate ownership of mineral deposits continued to rest with the crown, while the "*dominium utile*" was conceded to individuals. This provision, carried over virtually without change into the Mining Code of the Mexican Republic, is of interest in giving precedent to the provision of Art. 27 of the Constitution of 1917 which declares the nation to be ultimate owner of all mineral deposits.

that careful records were to be kept of the work performed by each miner. Although the system of withholding wages for debts was recognized, it was restricted by the provision that no more than one-quarter of the wages might be withheld for this purpose. Article 9 forbade the employment of Indians under the *repartimiento* system beyond the time of their required tour of duty. Articles 10 and 11 concerned the regulations governing work paid for by the *partido* system, that is, where a worker was paid so much for extracting a certain quantity of ore in a day and a share of any additional ore beyond this fixed amount. The reader will remember that the abuses arising under this system were largely responsible for the disorders at Real del Monte a number of years earlier. While the code provided that the system might be followed in any case with the free consent of the employer and employees, it laid down explicit regulations to safeguard both parties. In their final form, these sections were much more extensive and explicit than in the manuscript draft. Articles 13 and 14 dealt with the procurement of labor for the mines. Article 13 provided that all idle persons or vagabonds might be compelled to work in the mines, with the exception of Spaniards or mestizos reputed to be Spaniards—an exception which did not appear in the manuscript. Article 14 concerned the *repartimiento* of Indians for labor in the mines. In general it simply enjoined adherence to the old laws and customs, but the latter part of the article which was not in the manuscript limited the number of Indians which might be taken to 4 per cent of any village and provided that as far as possible Negroes, the lower ranks of mestizos, and criminals should be employed so as to spare the Indians. Articles 15 and 16 limited the enforcement of the *repartimiento* system in places where the mines had been abandoned, decreeing that if these mines were reopened they might claim this labor but new mines or neighboring ones might not. The remaining articles specified measures to prevent workers from leaving a poor

mine for a richer one, and provided for the punishment of various crimes and delinquencies — in milder terms than in the original draft. While these articles evidence a desire to protect the worker from abuse, they also show that the *repartimiento* system of compulsory mine labor was authorized right down to the end of the eighteenth century.

Title XIII contained regulations designed to assure the abundant supply of food, water, and materials to mines. Most of this Title was devoted to formal directions as to the duties of the *Diputaciones de Minería*, the measures to be taken to assure the equitable distribution of supplies and prevent exorbitant prices, and the maintenance of adequate highways and bridges. Two of the articles have a broad interest which makes them worthy of special mention. Article 4 recalled the old *Mesta* system of Spain. It stipulated that animals intended for the mines, either as food or for carrying supplies, should be allowed to pass freely through all lands, both public and private, paying nothing except where local custom allowed a private person to charge a moderate fee for the passage of animals. Prospectors were also permitted to take with them one saddle horse and one pack horse and have free forage for them in all places both public and private. The last sentence of the article, which was not in the manuscript draft, safeguarded against the abuse of these privileges and injury to third parties. This article is an indication of the importance given to the mining industry and the determination to assure the supply of provisions and promote the discovery of new mines even if it meant sacrificing the interests of agriculture. The other article of broad interest concerned the supply of wood and timbers for mines. This was as follows:

The woods and forests near to the mines shall serve to supply them with timber for their workings and wood and charcoal for the smelting of their ores; this being understood to apply equally to those [woods] which are the property of individuals, provided that they are paid a just price; to which effect the latter shall be prohibited

from extracting timber or firewood from their said properties for other villages which can be provided from distinct regions.<sup>83</sup>

It is in large measure due to this provision, or rather the principle back of it, that such wide areas of Mexico are today bare of trees and suffer the inevitable effects of erosion and drought. In fact, it has been determined that the dust storms which periodically sweep over Mexico City are as much due to the destruction of the forests around Pachuca as to the draining of Lake Texcoco. This deforestation is one of the items that must always be included in the price paid for the dominant position which mining has held in Mexico.

Title XIV concerned the regulations affecting *Maquileros* — brokers who smelted the ore of small miners on a commission basis and supplied quicksilver, salt, and other materials under the same system. While the desirability of this practice as a matter of convenience was admitted, it was recognized that there had been abuses and fraud. Hence careful rules were laid down governing the relations between broker and miner. These covered such subjects as who might enter into such contracts of purchase and sale, how the ore was to be weighed and assayed, the determination of the price, and the settlement of disputes. The commission that the broker might take was strictly limited as well as freight which might be charged for the transport of ore and supplies. It is evident throughout that the purpose was to protect the small miner from abuses at the hands of unscrupulous brokers.

Title XV dealt with the relations between miners and *aviadores* — persons furnishing capital or supplies to mines, and *Mercaderes de Plata* — dealers who bought the silver bullion from the miners. Taken in conjunction with the next Title on the *Banco de Avíos*, this gives a complete picture of the system of financing mines. Article 1 described the two types of arrangements usually entered into between miner and

<sup>83</sup> Tit. XIII, Art. 12.

*aviador*: — the first whereby the miner sold to his supplier the metal produced from his mine at a discount from its legal price, the latter benefiting from the premium; the second whereby the *aviador* became part owner of the mine. The article stipulated that in order to avoid frauds and usurious conditions the terms of every arrangement between the two parties should be specified in a written contract. Article 2 directed that in working out the premium to which the *aviador* should be entitled, the amount of silver which was shipped to him at one time and the frequency of these shipments should be taken into account and clauses included to cover variations in these. Article 3 ordered that when the miner gave a mortgage or other form of security, the premiums on the ore delivered should be such that their sum should not exceed 5 per cent per annum on the capital invested. The remaining articles stipulated the respective duties and responsibilities of the miner and supplier in great detail with the object of avoiding as much litigation as possible and safeguarding the interests of each party.

Article 10 concerned the regulations governing dealers in gold and silver. The first part of the article ordered that inasmuch as they did not advance money to mines or incur any risk, they were to pay the fair market price for the metal they bought, or if they paid in supplies, they were to be of good quality at current prices. The second part, which did not appear in the manuscript, prescribed strict rules to prevent the evasion of royal taxes and registry of the metals with the royal officials. The other articles of this title sought to safeguard both the miner and the government from abuses at the hands of these dealers.

Title XVI brings us to the subject of the *Banco de Avíos* and the general economic functions of the Tribunal. As this was one of the most important innovations in the mining practice of New Spain and one of the subjects which will engage our attention, this Title must be studied in some detail.

Article 1 provided that all silver produced in Mexico should pay a contribution of two-thirds of a real in each marc of silver "for the purpose of forming, conserving, and increasing the endowment fund of the said mining industry"; and it was further ordered that no miner should be exempt from this contribution, even though he be excused from certain of the royal taxes.

Article 2 stipulated that the administration, collection, and custody of this fund should at all times be in the hands of the *Cuerpo de Minería*, as represented by the Tribunal. Article 3 stated that after the expenses of the Tribunal, the School of Mines, and any other extraordinary ones had been deducted, the balance of the funds collected, together with any interest or principal which might be received thereon should be used for the purpose of supplying capital to the mines of New Spain. This capital was to be administered through a bank under the rules laid down in the succeeding articles.

The Tribunal constituted the Board of Directors of the bank which was to be managed directly by a factor appointed by the Tribunal and removable by it. This official was to receive a salary or a percentage of the profits of the bank as determined by the Tribunal. The main funds of the bank were to be kept in a vault with four keys, to be held by four members of the Tribunal, while the money and supplies necessary for current needs were to be in the custody of the factor who should be responsible for them. Articles 7 and 8 provided that the Tribunal should make an annual inventory of the holdings of the bank and an audit of its accounts, and also that the Tribunal should keep track of the accounts and correspondence of the various miners financed by the bank and issue its orders to the factor as indicated thereby.

Article 10 directed the factor to receive all silver shipped by miners financed by the bank and exchange it for currency at the Mint. It also stipulated measures to assure payment of the royal taxes — a section which was not included in the

manuscript. Article 11 specified the manner in which the factor should make payments on behalf of the bank. All payments except for the remission of funds to miners were to be made only on a warrant of the Tribunal. Regular payments in favor of miners being supplied by the bank did not require specific warrants, but only the general order of the Tribunal could authorize the grant of assistance to a given miner up to a certain limit. Articles 12 and 13 charged the factor with the responsibility of making purchases of materials and provisions to be supplied to the miners and required that he keep careful accounts of these and that they be of good quality and bought and sold at current prices.

Article 14 required the owners of mines seeking help from the bank to file proof of their title and ownership, together with information as to the condition and circumstances of the mine. If this preliminary data seemed to promise good possibilities, the Tribunal was to make a painstaking and secret investigation of all aspects of the mine and its owner. Article 15 provided that when the funds of the bank were not sufficient to supply the needs of all who applied and were properly qualified, preference should be given to those mines whose necessity was greatest and which offered the best possibilities, and for no other reasons whatsoever. This differed from the corresponding provision in the Tribunal's draft, which gave preference to certain other categories of mines — such as new discoveries and mines in decayed districts — going beyond the strict test of necessity. Article 16 directed that once the Tribunal had decided that a given mine was worthy of being financed, a contract should be entered into with the owner along the lines indicated in Title XV, and stipulated that the bank should be entitled to no special privileges over private banks or capitalists.

Articles 17 to 20 authorized the placing of interventors, or representatives of the bank, in all mines financed by it and defined their position. They were to have joint control with



the owner of all funds or supplies furnished by the bank, to check on the laborers and the metal produced, and in general to keep themselves informed on and safeguard all aspects of the mine which might affect the interests of the bank. However, they were not to interfere with the owner or manager in the actual operation or management of the mine, except that any undertaking of considerable cost was to be referred to the Tribunal for its approval. Likewise, the interventor was to leave the owner free in his choice of executives. He could warn the owner of anything he thought needed remedying and, if his advice was not taken, report it to the Tribunal. Finally, there was a provision for the salary of the interventor and the enforcement of his responsibilities.

The final article made it clear that if there was rivalry between the bank and a private bank or individual for the financing of a mine, the latter was to have preference. It was to be understood that the former private business of supplying mines was to be continued and that the only purpose of the bank was to supply the lack where private capital was not available. If the carefully drawn provisions of this Title had been strictly adhered to by the Tribunal it is probable that many of the subsequent losses could have been avoided.

Title XVII treats of the qualifications, duties, and responsibilities of mining engineers. To meet the need for persons trained in the various sciences relating to mining and metallurgy, it established the two professional titles of *Peritos Facultativos de Minas* and *Peritos Beneficiadores*, or, as we would style them, mining engineers and metallurgical engineers. It stipulated that all persons aspiring to these professions should be examined and licensed by the *Tribunal de Minería* and that no person not so licensed should use these titles or practice in such capacity, even though he might hold a university degree or title in some particular branch of the science.

The Title also provided that mining engineers should have

at all times the necessary instruments for measuring, surveying, and performing their other duties, and metallurgical engineers a laboratory equipped with furnaces and scales for assaying — this equipment in both cases to be subject to a periodic inspection for accuracy. Article 4 ordered that the mining engineers should examine all who wished to engage in mining as foremen, or master craftsmen, in any of the various branches, such as masonry or carpentry, and that no one should work or seek employment in any of the capacities who had not been passed by the engineers. A similar rule applied to the examination of master workers in the refineries by the metallurgical engineers.

Mining and metallurgical engineers were to assist at all official inspections of mines and perform all other professional duties which might be required of them by the mining judges or deputies. For these services they were to be recompensed according to a schedule to be worked out by the territorial deputations, the Tribunal, and the Viceroy. Until there were sufficient graduates of the School of Mines to supply the necessary number of engineers, persons engaged in the practice of mining were permitted to present themselves for examination, and on being found satisfactory by the Tribunal might be granted licenses. It was further commanded that in the future no weight should be given to the opinions of persons who had not been so licensed and no mineowner should employ unlicensed persons as engineers. The final article granted these engineers the privileges of miners and directed that they were to be persons of good reputation and character.

Title XVIII dealt with the School of Mines and the education of mining engineers. Article 1 spoke of the need for young men trained in the theory and practice of mining, and the desirability of accomplishing this by a systematic education rather than by the uncertain method of laborious experience relied on in the past. It then ordered that if it be not already established, there be founded a school or college, as proposed

by the deputies-general of the *Cuerpo de Minería*. Inasmuch as the rules for the organization and operation of this institution followed closely the ideas suggested by Lassaga and Velásquez de León in 1774, and as a later chapter will deal with the subject of education in detail, it is not necessary to describe the individual articles of this Title. They made adequate provision for all phases of the School's existence, including the choice of professors and the collection of books, instruments, and mineralogical specimens. Aside from the School itself, this Title laid the basis for what might be called extension work in improving the technique of mining.

The final Title of the Ordinances dealt with the privileges accorded to miners, and made certain stipulations as to the observance of the various rules laid down. First of all, the profession and practice of mining was declared to be a noble one, its members to be treated with all respect and dignity. In general the privileges consisted in freedom of the owners and managers of mines from arrest for debt and the exemption of certain articles of their personal property from seizure for the satisfaction of judgments. Likewise, they were to have privileges of hunting, fishing, pasturage, and cutting wood in the places where their mines were situated just as if they themselves were residents. Miners were also to be favored in the division of house lots or houses to rent. In addition to these general privileges, the Tribunal was instructed to inform the King from time to time of persons who, through special zeal, poverty, or other cause should be rewarded by the grant of special favors. Sections 10 and 11 were designed to correct the prodigality and wastefulness of miners in dissipating their fortunes. The former urged economy and sobriety and imposed upon the deputies the duty of cautioning miners whom they deemed guilty of wasting their wealth. It provided further that in flagrant cases the deputies should report to the Tribunal which might appoint a conservator to protect the fortune of the person involved. The last two articles stipulated

the authority which the Ordinances were to have. The *Tribunal de Minería* and all other royal Tribunals, judges, and officials were ordered to observe and enforce them as royal laws and statutes. All other laws inconsistent with them were repealed and it was ordered that they should always be applied directly according to the clear intent of the law, without resort to technicalities, interpretations, or glosses. If these rules did not cover a certain case, the practice of the *Consulados de Comercio* was to be applied, but in all cases of doubt reference was to be made through the Viceroy to the King for his decision.

From the foregoing summary the scope of these Ordinances is evident. They dealt comprehensively with both the organization of the industry and the rules to be applied to all its problems. The fact that they were drawn up by persons familiar with conditions in the New World was of the utmost importance, and was undoubtedly the reason why they proved so successful in practice. It has already been mentioned that they were extended to all of South America and the Philippines and had an influence on the mining laws of the United States.

## CHAPTER III

### FINANCIAL HISTORY OF THE TRIBUNAL, 1777-1787

DURING the years when the Mining Code discussed in the last chapter was being drawn up and perfected, the *Tribunal de Minería* was already functioning along the lines laid down in these Ordinances. In certain matters the delegates to the junta which established the Tribunal had been acting as an informal Tribunal since early in 1777, and once the organization was completed in May of that year, the Tribunal began to exercise its functions as the governing body of the mining industry.<sup>1</sup> Hence we have now reached the point where we may take up the work of the Tribunal itself during its existence from 1777 to 1821.

This was of such a varied nature that an attempt to review it in an orderly manner presents certain difficulties. The Tribunal was charged with many different functions, but while some of these, such as finance and education, lend themselves to topical treatment, most of them were so interrelated that separate treatment would involve considerable confusion and repetition. The same is true of a strictly chronological treatment. Hence a combination of the two methods has been decided upon.

After a brief summary of the most important landmarks in the general development of the Tribunal from 1777 to 1820, we will consider in this chapter its activities from 1777 to 1787 as Board of Directors of the *Banco de Avíos* and trustee of the large funds placed at the disposal of the *Cuerpo de Minería*.

For the first ten years after its organization, the *Tribunal de Minería* led a relatively peaceful existence. It was kept

<sup>1</sup> This applies to the administrative field; it did not enjoy the exercise of *jurisdicción contenciosa* until after promulgation of the Ordinances.

busy with the consideration of every sort of question concerning mining and, although there were frequent disagreements between the mining interests and other branches of the government, there was no serious unpleasantness to mar the satisfaction which the Tribunal enjoyed in its new dignity. True, later revelations showed a laxness and complacency in financial matters which served to diminish sensibly the reputation of these first years. But, on the whole, it must have been a pleasant time for the members of the Tribunal. They were the elected heads of an important industry, remarkably free from royal control in their own affairs and with a position of honor and dignity in the community. The members of the Tribunal during these first ten years were as follows:

Don Juan Lucas de Lassaga, Administrator-General

May 24, 1777 until his death, February 7, 1786

Don Joaquín Velásquez de León, Director-General

May 24, 1777 until his death, March 6, 1786

Don Tomás de Liceaga, Deputy-General

May 24, 1777 until his death, February 3, 1779

Don Marcelo de Anza, Deputy-General

May 24, 1777 until his death, May 17, 1781

Don Julián del Hierro, Deputy-General

May 24, 1777 to December 1, 1786; Administrator-General

December 1, 1786 until his death, April 24, 1787

Don Ramón Luis de Liceaga, Deputy-General

February 6, 1779 — December 31, 1793

Don Antonio Villanueva, Deputy-General

June 28, 1781 until his death, December 9, 1784

Don Antonio Barroso, Deputy-General

December 1, 1786 — December 31, 1793

Don Antonio Basoco, Deputy-General

December 1, 1786 — December 31, 1793<sup>2</sup>

It was with the almost simultaneous death of Lassaga and Velásquez de León early in 1786 that the honeymoon period

<sup>2</sup> From a report of Pedro María de Monterde, appointed to audit the accounts of the Tribunal during the reorganization, dated July 31, 1788; *A.G. Minería*, vol. 63, f. 4.

of the Tribunal's existence came to an end. Rumors must have been circulated prior to this time that its finances were not in good order, as three weeks after the death of Lassaga the Viceroy ordered the Tribunal to send him its complete accounts to date.<sup>3</sup> By May, word of the situation had reached the King, and on the 27th he issued an order suspending the right of the Tribunal to make loans and finance mines; this also directed that Don Eusebio Bentura de Beleña, Judge of the Audiencia, should assume the post of ad interim assessor of the Tribunal in place of Velásquez de León.<sup>4</sup> The intervention of the crown was carried considerably further by an order of July 19, 1786, which definitely suspended, for this occasion, the elections called for in the Ordinances, and filled the vacancies in the Tribunal by royal appointment rather than election by the *Cuerpo de Minería*. The Senior Deputy, Julián del Hierro, was promoted to be administrator; an entirely new figure, Fausto de Elhuyar, Professor of Mineralogy and Royal Pensioner in Vienna, was appointed Director-General; and two members of the commercial fraternity of Mexico, D. Antonio Barroso and D. Antonio Basoco, were named to the two vacant posts of deputies-general.<sup>5</sup>

The detailed story of the reorganization, of which these were but the first steps, must await its proper place. The representative character of the Tribunal did not entirely disappear; the provincial centers continued to elect their local deputies; there were general juntas in Mexico; and subsequently elections of members of the Tribunal were held. But there can be no denying that during the long period of

<sup>3</sup> Viceroy (Gálvez) to Tribunal, Feb. 27, 1786, *A.G. Minería*, vol. 48, f. 114; cf. below, p. 82.

<sup>4</sup> José de Gálvez to Viceroy (Bernardo de Gálvez), May 27, 1786, *A.G. Cédulas*, vol. 134, No. 53. It is of interest that Beleña had been subdelegate of the *Visita* of Gálvez; during one period he was out of favor with Gálvez; but returned to become *regente* of the Audiencia. Priestley, *José de Gálvez*, p. 244.

<sup>5</sup> *A.G. Cédulas*, vol. 134, No. 135. For further details regarding the appointment of Elhuyar, cf. below, pp. 165-167.

reorganization the Tribunal lost much of its prestige and a good part of the autonomous authority granted it by the Ordinances and enjoyed during the first decade. While some of this independence was subsequently regained, the dominant figure in the Tribunal after 1789 was the Director, Fausto de Elhuyar, a Spaniard and a royal appointee. Under his guidance, the Tribunal gradually won back its lost prestige and enjoyed a peaceful existence until the outbreak of the struggle for independence.

The years 1810 to 1821 brought renewed financial embarrassment to the Tribunal, which was entirely natural considering the almost total cessation of mining in many parts of the country. Notwithstanding this, it is possible that the Tribunal might have maintained its position if it had not been for the continual "loans" which were demanded of it by the government in Spain to bolster the shattered finances of the monarchy and pay for its foreign wars. Although the Tribunal was on the whole conservative and opposed independence, it is significant of the importance of its work that it did not entirely die when Spanish authority was removed, and that many of its activities were continued in one form or another for some years under the various independent governments of Mexico.

As indicated above, this chapter will analyze the financial history of the Tribunal, from its beginning to the period of reorganization in 1786. It may seem odd to concentrate on one particular phase before considering the more general activities, but there are various reasons for this. In the first place, it must be remembered that the strongest motive behind the movement which led to the creation of the Tribunal was the desire to have some agency which could supply capital to mines. This was the purpose of the *Banco de Avíos*, set up under the Tribunal, and of the grant to it of an assured revenue through the assignment of two-thirds of the real in each marc of silver formerly collected as double seigniorage. Hence, it



is appropriate to examine the manner in which the Tribunal discharged its primary purpose and administered the funds entrusted to it. Furthermore, the other activities of the Tribunal continued along the same general lines throughout its existence and may be studied as a whole, but the financial history was greatly modified by the reorganization of 1786-1793, and it is impossible to understand the latter without having studied the causes leading up to it.

Most of the material dealing with these financial matters is retrospective in nature. While the original account books of the bank and Tribunal are missing, we are fortunate in possessing the full accounts drawn up in response to the orders of the King and Viceroy in 1786, which were presented, with some of the original vouchers, to the latter and to the *Junta de Arreglo* summoned to examine the affairs of the Tribunal. There are a number of different accounts, some general and some special, as well as the exhaustive audit of all these made by Pedro María de Monterde, who was appointed by the King for this purpose. A fairly comprehensive study of all these accounts offers the best means of understanding the financial aspects of the Tribunal during these first ten years.

The first move to procure from the Tribunal the records of its financial stewardship was made by the Viceroy in the letter of February 27, 1786, mentioned above. This letter demanded the prompt rendering of a complete account of the Tribunal, giving full information on the following particulars:

1. The total income received by the Tribunal from January 13, 1777 to February 7, 1786, by virtue of the contribution of eight grains in the marc paid by all silver entering the Mint.
2. The manner in which this income had been spent, with the various items listed and explained in detail.
3. The total paid to members and employees of the Tribunal in salaries.
4. The total of *avíos* advanced to mines.
5. A detailed description of each mine financed and of the sums advanced to it by the Bank.

6. How much each mine financed had repaid of the money loaned it and the existing balance in each case.
7. The total collected from the extra impost of four grains in the marc extracted from the miners from September 1, 1782, to August 31, 1785, to pay the interest on the loan of \$1,000,000 to the crown.<sup>6</sup>
8. The current balance in the vaults of the Tribunal.<sup>7</sup>

In response to this order from the Viceroy, the Tribunal sent him on March 30, 1786 a general account of the handling of its funds together with a covering letter seeking to justify the bad condition revealed.<sup>8</sup> This account was not altogether satisfactory and need not detain us as it contained nothing which was not explained more fully in the accounts which we will study. Suffice it to say that in the next months the scope of the investigation was broadened considerably by a series of royal orders which appointed Pedro Maria de Monterde, of the Tribunal of Accounts, as auditor of the Tribunal's books. He required comprehensive information and it was July 1787 before the Tribunal presented its full general account, which appears in the following pages.<sup>9</sup> This was signed by Ramon Luis de Liceaga, Antonio Barroso, and Antonio Basoco, and dated July 10, 1787. While it was subjected to severe criticism and a number of its items disallowed, it is extremely important as the Tribunal's own statement of its financial stewardship.<sup>10</sup>

A general account of receipts, disbursements and balance of the funds of the *Tribunal General de Minería* of New Spain from the

<sup>6</sup> The history of this loan will be fully explained below.

<sup>7</sup> *A.G. Minería*, vol. 48, f. 114.

<sup>8</sup> The letter and account of the Tribunal of March 30, 1786 are in *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2240.

<sup>9</sup> The events sketched here will be described more fully in the next chapter on the *Arreglo* itself. Only enough has been said to indicate how the account happened to be drawn up.

<sup>10</sup> It should be noted that none of the Ministers signing the accounts were original members of the Tribunal; Liceaga was elected in 1779 to fill the vacancy caused by the death of his brother, and Barroso and Basoco had been appointed by the King in 1786.

thirteenth of January, 1777, when there began the collection of an endowment contribution of eight grains of a real in each marc of silver of eleven dineros up to the thirtieth of June, 1787, when this account was taken,—the first which has been given since the foundation of the Tribunal, with its vouchers.<sup>11</sup>

## RECEIPTS

Item 1.	Income from the contribution of eight grains in each marc of silver, January 13, 1777—December 31, 1786—taken from the five books presented to the Tribunal by the Officials of the Royal Mint in which have been entered each year that produced by the said contribution according to an examination made of these books on June 21, 1787, by the Clerk, Don Mariano Arroyo.	1,520,267.3.10
Item 2.	Income from the endowed contribution in the six months extending from January first to the thirtieth of June, 1787, according to the certificate given by Antonio Delcampo Marín accountant of the Royal Mint.	67,425.5.6
Item 3.	Received at interest, November 11, 1777, from the fund of Temporalidades for the purpose of a gift of equal amount to His Majesty, of which item there are no vouchers nor is it necessary because so well known.	300,000.0.0
Item 4.	Received at interest on May 11, 1785, from the College of Lawyers of this City; and although the voucher is dated May eleventh the interest runs from the first of said month.	11,000.0.0
Item 5.	Received at interest in similar form on May 21, 1785, from Don Manuel José Gainza a citizen of this city.	8,000.0.0
Item 6.	Received at interest in similar form on May 23, 1785, from Doña Ignacia Rodríguez Monterde of this City.	10,000.0.0
Item 7.	Received as interest on the 110,000 pesos of the funds of the bank with which was completed the million pesos that was loaned to His Majesty for the necessities of the last war, and said interest runs from August 1,	

<sup>11</sup> This account appears in *A.G. Minería*, vol. 63, ff. 127-135.

	1782 to July 24, 1785 on the 50,000 pesos and on the 60,000 pesos remaining to September 16 of the said year.	16,838.3.7
Item 8.	The total to which amount the premiums on the silver delivered to and exchanged in Royal Mint by the miners <i>aviados</i> , which amount has been taken from the two books of the Factor in which the separate accounts have been kept as certified by Don Mariano Arroyo.	26,827.5.6
Item 9.	Income from the contribution of four grains temporarily imposed for the payment of the interest of the million pesos, after the payment of all the amounts due up to the end of March, 1787, in the manner and form shown in the particular account and the documents which accompany it.	40,144.5.8
Item 10.	Received 15,795.3.1 which up to June 30, 1787 produced by the goods sold at auction of those seized from Don A. Del Varrio, less the expenses according to the account given by the present Factor, Don Manuel Prieto Garcia—leaving a net produced from said goods.	15,518.5.1
Item 11.	Received by the Factor from the sale at various prices of 134 copies of the Ordinances.	504.0.0
	Total	<hr/> \$2,016,526.5.2

## DISBURSEMENTS

Item 1.	Salary of Don Juan Lucas de Lassaga, Administrator General at the rate of 6,000 per year from May 24, 1777 until his death, February 7, 1786, as certified Don Mariano Buenaventura de Arroyo.	52,234.7.0
Item 2.	Salary of Don Joaquin Velásquez de León, Director General at 6,200 pesos per year being 5,000 as Director and 1,200 as Assessor from May 24, 1777 until his death, March 6, 1786 certified as above.	54,468.2.0
Item 3.	Salary of Don Tomás Liceaga, Deputy General, from May 24, 1777 until his death, February 3, 1779 certified as above.	6,769.7.10

Item 4.	Salary of Don Marcelo de Anza, Deputy General, from May 24, 1777 until his death May 17, 1781, certified as above.	15,914.5.2
Item 5.	Salary of Don Antonio Villanueva, Deputy General from June 28, 1781 when he took possession of the office, until his death, December 9, 1784.	13,799.4.6
Item 6.	Salary of Don Julian del Hierro, Deputy General at the rate of 4,000 pesos per annum from May 24, 1777 until the end of November 1788 when he became Administrator General by the nomination of His Majesty.	38,071.7.4
Item 7.	Salary of Don Julian del Hierro, Administrator General, December 1, 1786 until April 24, 1787.	1,978.5.06
Item 8.	Salary of Don Ramón Luis de Liceaga, Deputy General at the rate of 4,000 pesos per annum from February 26, 1779 when he took possession of the office to December 31, 1786.	31,114.2.8
Item 9.	Salary of Don Ramón Luis de Liceaga from January 1 to June 1, 1787 at the rate of 3,000 pesos per annum in accordance with Royal Order of July 19, 1786; but it should be noticed that petition has been made to His Majesty concerning the continuation of the 4,000 pesos salary at which he entered the office.	1,500.0.0
Item 10.	Salary of Don Antonio Barroso, present Deputy at the rate of 3,000 pesos per annum from December 1, 1786 when he took possession until June 30, 1787.	1,750.0.0
Item 11.	Salary of Don Antonio Basoco, present Deputy for the same period.	1,750.0.0
Item 12.	Salary of the Justice, Don Antonio Villanueva, as Judge of Appeals, from June 1, 1784 to end of December, 1785.	1,500.0.0
Item 13.	Salary of Don Miguel Calixto de Azedo, for the same position from January 1, 1786 to October 31, 1786, when he left for Spain.	833.2.0
Item 14.	Salary of Don Balthasar de Guevara for the same position from November 1, 1786 to the end of June 1787.	666.5.0

Item 15.	Salary of Don Eusebio Bentura Beleña as Assessor, named by His Majesty, from August 20, 1786 to June 30, 1787, at the rate of 1,200 pesos per annum.	1,037.2.0
Item 16.	Salary of Don José Manuel de Arrieta, Factor, at the rate of 3,000 pesos per annum from September 1, 1784 to February 20, 1787.	7,410.7.0
Item 17.	Salary of Don Manuel Prieto as Factor, February 22, 1787 until June 30, 1787.	882.3.4
Item 18.	Salary of Don Mariano Buenaventura de Arroyo as Secretary of the Tribunal at the rate of 1,200 pesos per year from May 24, 1777 to June 30, 1787.	12,122.6.0
Item 19.	Paid to said Secretary Arroyo by the assignment which was made to him for the expense of stamped paper, pens, and ink at rate of 50 pesos per year from May 24, 1777 until the end of December 1785, when his stipend ceased because he did not wish to continue the agreement.	430.1.0
Item 20.	Salary of Don Pablo Castel as Porter of the Tribunal at the rate of 300 pesos annually from September 2, 1777 until his death February 8, 1786.	2,538.5.0
Item 21.	Salary of Don José Joaquin Verra, Porter from March 4, 1786 until his death on January 17, 1787.	260.6.9
Item 22.	Salary of Don Ignacio de la Fuente as second porter from March 4, 1786 until July 7, the same year when he resigned.	102.5.9
Item 23.	Salary of Don José Sixto Gonzales, Successor of Verra in the job of Porter, from January 19, 1787 to June 30, 1787.	135.4.6
Item 24.	Salary of Don Vizente Joseph Saludo, who served in the position of Porter during the time when Verra was sick.	8.1.0
Item 25.	Salary of Don José del Castillo as Porter of the College at the rate of 200 pesos per annum, from January 1, 1784 to June 30, 1787, since although he served from the previous March, he was paid by Don Julian del Hierro as is certified in the accounts which the latter presented for the repairs of said College.	699.7.0

Item 26.	Paid out to the Porter Castillo for two servants who cleaned and washed the offices of the Tribunal from June 30, 1784 to June 30, 1787.	75.5.8
Item 27.	Salary of Don José Mariano Cuevas, Chief Clerk of the office at the rate of 400 pesos per year from March 17, 1785 to June 30, 1787 in which amount is included 300 pesos which was given him for the time that he had previously served at that salary.	1,216.4.8
Item 28.	Salary of Don Alexandro Velásquez as Second Clerk from August 24, 1786 to June 30, 1787.	253.0.06
Item 29.	Salary of Don Francisco Riofrio, Solicitor of the Royal Audiencia at the rate of 100 pesos annually as Attorney of the Tribunal from June 7, 1786 to June 30, 1787.	106.4.8
Item 30.	Paid to the officers and employees of the Royal Mint as expenses and fees for the collection of the eight grains during the first ten years from January 1777 to the end of December, 1786 as indicated in the accounts books which they presented.	32,305.6.0
Item 31.	Paid to the officials of the Royal Mint as their fees at the rate of 3,000 pesos per year for the six months of the present year which sum is less the annual <i>existencia</i> which is recorded and charged by months.	1,605.0.0
Item 32.	Paid to Don José Antonio Morales, Clerk of the said Royal Mint, as fees for the first four years from 1777 to 1780 inclusive, the remaining 100 pesos annually having been included in the former sum.	400.0.0
Item 33.	Salary paid to Don José Ignacio Beye de Ciseros as Assessor of the Tribunal for the time which he attended from the death of Velásquez until the succession of Beleña.	84.6.6
Item 34.	Paid to Don Tomás Subiaur, Business Agent, who acted as Attorney of the Tribunal from the year 1778 to 1785 inclusive.	7,069.0.0
Item 35.	Paid to the present attorney, Don Francisco Riofrio, Solicitor of the Royal Audiencia, for judicial expenses.	600.0.0

Item 36.	Paid out as judicial expenses in the office of the Superior Government in charge of Don Juan Martínez de Soria.	2,984.7.0
Item 37.	Paid out on July 5, 1778, for the purposes referred to in the note of Don Joaquín Velásquez at Folio 67.	165.0.0
Item 38.	Paid out for nine celebrations to the Virgin of Guadalupe from the year 1778 to 1786 inclusive in the manner described in Folios 68-96 where are the respective vouchers.	3,570.1.6
Item 39.	Paid out for the expenses of the bull-fight held in the year 1783 to celebrate the entrance of His Excellency, Don Mathias de Gálvez in which sum is included the detailed account given by the Factor and approved by the Tribunal.	2,911.7.6
Item 40.	Paid out for expenses of the bullfight in the year 1785 for the purpose of celebrating the entrance of the Count of Gálvez of which sum a voucher of 1,200 pesos was presented for the seats, and another of 1,072 pesos 6 reals as shown at ff. 98-100, for the other expenses consisting of wine, sweets and biscuits for which there are no receipts.	3,146.6.0
Item 41.	Paid to the Scribe, Don Juan Francisco Velasco on the sixteenth of June, 1786 as a fee for his attendance at the General Junta, held in 1784.	100.0.0
Item 42.	Sent to Spain in the month of November, 1777, for the expenses in the Court of Don Fermín Sanchez Muniaín.	8,000.0.0
Item 43.	Sent to Spain in the year 1784 consigned to the Directors of the Three Guilds of Madrid, to be paid to the Attorney, Don Juan de Escolano for expenses of the Ordinances.	10,000.0.0
Item 44.	Paid out as freight to Vera Cruz and shipping expenses for the foregoing items.	157.0.0
Item 45.	Paid to the Lic. Don Joseph Manuel Sierra on June 7, 1786 for the cases referred to in his receipt at Folio 102.	48.0.0
Item 46.	Paid to Don Juan José Ortega, July 5, 1786, as described in his receipt f. 103.	12.0.0



Item 47.	Paid to Don José Manuel de la Sierra for the reasons referred to in his receipt in f. 104.	60.0.0
Item 48.	Paid to Don Balthaza Garcia Puertas for that referred to in his receipt f. 105.	49.0.0
Item 49.	Paid out to Don Mariano Arroyo as described in his account at f. 106.	57.1.0
Item 50.	Paid out to Don Antonio Gonzales for that referred to in his receipt f. 107.	200.0.0
Item 51.	Paid out to Don José Miguel Montezuma according to his account at f. 108.	40.0.0
Item 52.	Paid out to Don Manuel . . . for auditing the books of Señor Velásquez.	30.0.0
Item 53.	Paid out to Don Aniceto del Varrio for the expenses which he had during the month of the erection of the Tribunal.	2,042.7.0
Item 54.	Paid to the Factor, D. José Manuel de Arrietta, for the decoration of the Tribunal, etc., f. 113.	3,313.4.6
Item 55.	Paid to D. Felipe Zuñiga, for printing, as indicated by his receipt, f. 114.	19.4.0
Item 56.	Paid to the Director of Quicksilver, D. Francisco Ramirez, for the reasons expressed on f. 115.	192.0.0
Item 57.	Paid to D. Juan Ant. Yermo, atty. for Da. Juana Muniain, widow of D. Fermín Sanchez Muniain for the widow's pension which she was assigned and enjoyed until her second marriage.	734.2.0
Item 58.	Paid to the said Yermo for the reasons indicated at f. 118.	300.0.0
Item 59.	Paid to D. Pedro Vertiz, for the freight to Mexico on the boxes of Ordinances.	175.0.0
Item 60.	Paid to the Factor, D. José Manuel de Arrieta for expenses without vouchers explained in detail on the account at f. 120 and 121.	1,765.0.0
Item 61.	Paid to the said Factor for repairs to the College building, f. 122.	6.5.5
Item 62.	Paid to the silversmith, D. Eduardo Calderón for the four "Albortantes" shown in his account, f. 123.	165.3.0
Item 63.	Paid to Lic. D. Manuel Quixzo Zavala for the Representation referred to at f. 124.	46.0.0

Item 64.	Paid to Lic. José Ant. Linza, for the tariffs referred to at f. 125.	39.0.0
Item 65.	Paid out as the price of two candle stands, one candlestick, and two snuffers of silver, according to f. 126.	69.4.6
Item 66.	Paid out as expenses of the present Factor for miscellaneous petty items according to f. 127.	33.1.0
Item 67.	Paid out as expenses of said Factor in repairs of the house as shown by the memoranda at ff. 128-129.	58.2.0
Item 68.	Paid out as expenses of the said Factor for carrying letters from the beginning of his employment to June 30, 1787.	65.2.0
Item 69.	Paid to D. Juan Lucas de Lassaga, on November 3, 1778, as reimbursement for expenses he claimed to have incurred in various matters which had come before the Tribunal, according to the testimony and receipts at f. 130.	404.1.0
Item 70.	Paid to said Lassaga, on January 5, 1780, for the purposes recorded by the Tribunal at f. 131, the original having been sent to the Government.	2,000.0.0
Item 71.	Paid to the first and second clerks of the office of the Tribunal, on January 13, 1787, for extra work during the preceding vacations.	90.0.0
Item 72.	Paid to D. Juan Eugenio Santelices, January 11, 1787, for the postage on a dispatch from Havana to Spain by commission of the Tribunal for the year before.	69.0.0
Item 73.	Paid as part of the price of the College building, repairs to it, and interest on the \$24,000 due on it, to June 30, 1787, according to the detailed account of f. 134 and the vouchers at ff. 135-151.	27,529.3.0
Item 74.	Paid as interest on the \$29,000 taken in three lots in May, 1785, according to the account at ff. 152-153.	3,084.5.3
Item 75.	The total of active accounts which besides the mines financed, the Tribunal has in debt to it, according to the account of f. 157.	156,579.7.2

Item 76.	The total of extraordinary expenses as indicated in the account in Quarderno No. 2.	773,322.2.0
Item 77.	The total to June 30, 1787, spent in the rehabilitation of the twenty-one mines financed by the Tribunal, as described in detail in the <i>Cuenta Particular</i> , with records of each of the twenty-one undertakings.	702,345.3.7
Item 78.	Held in the Royal Mint on June 30, 1787, as certified by D. Ant. del Campo Mazin, auditor of the Mint to Superintendent.	13,659.3.0
Item 79.	Held in the Chancery, according to the report to the Factor to the sub-delegado del Sr. Fiscal.	3,144.5.2
		<u>\$2,014,529.05.02</u>

Total Receipts	\$ 2,016,526.05.02
Total Disbursements	2,014,529.05.02
	<u>\$ 1,997.00.00</u>

Cf. The result exposed  
in the judgment in  
favor of the funds  
of the Bank in No. 20.

There results a difference of \$1,997.0.0, which sum has not been discovered up to now, but the search for it continues.

Mexico, July 10, 1787.

[Signed]

Ramon Luis de  
Liceaga

Antonio Barroso  
y Torrubia

Antonio de  
Basoco

As indicated in the extract, summary and General Resolution which has been formed, and which begins the exposition of the judgment of this account, the Ministers have been made responsible for the income amounting to \$2,016,975.0.8, and there have been allowed as expenses \$1,807,280.1.3; according to which there results in favor of the funds of the Bank and against the Ministers \$209,694.0.6, according to the terms and reasons expressed in said judgment; in which likewise are noted those sums which appear against said funds and in favor of various interested parties — \$568.4.5; and finally there appear fifty-four (restorations — observations).

Mexico, 25 November, 1788.

[Signed] Pedro Maria de Monterde

With this general account before us we can take up the various items of receipts and disbursements and from them attempt to reach some conclusions as to the handling by the Tribunal of the funds of the Mining Guild. The receipts are relatively simple and were modified only slightly by the auditor. The income from the tax of eight grains on each marc of silver (Items 1 and 2) is explained in detail in a sworn statement submitted to the Tribunal by its secretary, D. Mariano Buenaventura de Arroyo, on June 21, 1787, which gives the amount collected each year from this source by the Royal Mint and credited to the Tribunal.<sup>12</sup> These figures show that the Tribunal could count on an average income of at least \$150,000 per year from this source. It will be remembered that in the discussions leading up to the formation of the Tribunal, and in the Representation of Lassaga and Velásquez de León of 1774 which resulted in the cessation of the double seigniorage, it was intended that the income from this source should be used to pay the running expenses of the Tribunal and the interest on a capital fund of \$2,000,000.<sup>13</sup> It had been intended that this \$2,000,000 be raised by borrowing at 5 per cent from individuals and foundations, with the tax-income as security, and that this capital be employed as a revolving fund for the development of mines offering good possibilities. This intention was not carried out. The general account shows a total of \$329,000 borrowed at interest from individuals and corporations, and, as we shall see, this was used for a purpose quite foreign to the object of the Fund. This, however, does not tell the whole story; in 1782 the Tribunal raised a sum of \$1,000,000 for the purpose of a loan to the crown, which amount was not entered in its regular accounts because of a specific order of the Viceroy to that effect. Inasmuch as this subject of forced loans and gifts to the crown was a continuous, and often most vital, factor in

<sup>12</sup> *A.G. Minería*, vol. 63, ff. 136-137.

<sup>13</sup> Cf. chap. ii, p. 42.

the finances of the Tribunal, it will be well to digress somewhat to discuss it thoroughly at this point.

The practice of raising funds for the Treasury, particularly in times of war, by the exaction of forced "gifts" or "loans" from semi-public and private corporations and individuals has been a common one with Spanish governments from time immemorial — and her daughters in the new world continue the practice to the present. The *Tribunal de Minería*, with its assured income, offered obvious possibilities along these lines. The evil which was to become so serious for the Tribunal had its beginning, however, in the seemingly free act of this body. Late in 1776, even before the formal organization of the *Cuerpo de Minería*, a gift of \$300,000 was offered to the King to aid in constructing the docks and shipyard of Guazacualco, apparently at the suggestion of Lassaga and Velásquez de León, who were rewarded with appropriate honors.<sup>14</sup> The ulterior motive of this largess was no doubt to influence the King to view with favor the aspirations of the mining community and its leaders. The gift was not paid immediately, but after the Tribunal had organized and funds had begun to be raised, the loan from the Fund of Temporalities (Item 3 in the Account) was diverted to this purpose on November 11, 1777.<sup>15</sup> The Tribunal was, of course, responsible for the payment of the interest and principal of this loan, the burden of interest alone amounting to \$144,561.05.01 up to June 30, 1787.<sup>16</sup>

Not content with this gift to the King, the Tribunal, on February 25, 1779, asked permission of the King to pay an annual pension of \$4,000 to José de Gálvez, in gratitude for

<sup>14</sup> *A.G. Cédulas*, vol. 110, No. 169, f. 259, Feb. 22, 1777; *Virreyes*, Ser. II, vol. 74/91, No. 2996. The actual offer has not yet been found; these two documents describe its acceptance and purposes; while no evidence of it has been found, it is possible that this gift had been "suggested" by the government.

<sup>15</sup> *A.G. Minería*, vol. 208, f. 79, *Cuenta particular de Gastos extraordinarios*, Item 1. This account is given in full below, at pp. 118.

<sup>16</sup> *Ibid.*, Item 2.

his extraordinary services to the miners of New Spain — and no doubt to assure the continued favor of the powerful Minister of the Indies.<sup>17</sup> Thus within two years after its foundation the Tribunal had burdened the Mining Fund with annual charges of \$15,000 for the interest on the money borrowed to make the gift to the King and \$4,000 for the pension to Gálvez.

As if these "gifts" — one is inclined to say bribes — to the King and the Minister of the Indies were not enough, it was not long before the Tribunal saw fit to go further in its generous handing out of funds for which it was trustee. The account of extraordinary expenses records a gift of \$100,000 to the Prince of Asturias made in the year 1780 which was followed in 1783 by a gift of \$50,000 to the Princess of Asturias.<sup>18</sup>

With these generous examples at hand, it is not surprising that when the crown found itself in need of money it should turn to the apparently fruitful source of the Mining Fund. This occasion arose as a result of the conflict between Spain and Great Britain incidental to the War of American Independence.

Early in 1782 the King made known the emergency needs of the Treasury and requested a loan of \$1,000,000 from the miners.<sup>19</sup> This loan was the subject of considerable debate within the Tribunal during all the month of July. It appears that the fiscal of the Hacienda had asked that the price of quicksilver be raised to one hundred pesos a quintal because of the added expenses of transportation arising from the war. The Tribunal had protested vigorously against such action,

<sup>17</sup> This request, its approval by the King (July 17, 1779), and the final vote of the Tribunal ordering the pension (Dec. 10, 1779) are recorded in *A.G. Cédulas*, vol. 117, No. 26; see also the *Cuenta Particular*, Item 14.

<sup>18</sup> The two gifts are recorded as Items 3 and 4 of the *Cuenta . . . de Gastos Extraordinarios*, *A. G. Minería*, vol. 208, f. 79.

<sup>19</sup> Viceroy to Tribunal, June 17, 1782; *A.G. Minería*, vol. 47, exp. No. 10, Doc. No. 15.

but the government decided to go ahead. Under these circumstances the Tribunal offered to make the loan of \$1,000,000 provided it received assurances that there would be no increase in the price of quicksilver and on the further condition that it be permitted to collect an extra ten grains on the marc on all silver brought to the Mint, to provide for the payment of principal and interest on the loan, in the same manner as the eight grains was already collected for the Mining Fund. The members of the Tribunal proposed that the government could repay this sum after the war by a corresponding reduction in the royal taxes and said that even if it was not paid promptly the Tribunal could repay the capital borrowed in eight years out of the extra impost. The government approved this proposal, but a number of miners and *aviadores* objected to the added tax and said the interest on the loan could be paid out of the regular Mining Fund. The Tribunal opposed diversion of its regular income to this end, and after consultation with the Superintendent of the Mint a compromise was agreed on whereby an extra four grains was to be collected on each marc of silver. This brought the total contribution up to one real, the amount previously collected as double seigniorage.<sup>20</sup> Under these terms the loan was agreed to, and the Viceroy wrote accepting it on August 1st, saying:

The motives are most praiseworthy which moved the well-known zeal, fidelity, and love of Your Excellencies to contribute in no small degree to the present needs of the Crown in the present long and costly war, with the prompt and cheerful loan of \$1,000,000; but, since, according to yourselves and the Superintendent of the Royal Mint, the impost of four grains on each marc of silver introduced for coinage at the Royal Mint is sufficient for the payment thereon, I have declared that this exaction shall continue only until the loan is repaid; provided, that the Mining Fund shall not take into [its regular] account this or other investments foreign to the

<sup>20</sup> This was all reported in a letter from Lassaga and Velásquez de León to Gálvez, dated Aug. 2, 1782, *A.I., Sec. 5, Aud. de Méx., Leg. 2241*.

purposes indicated by His Majesty in the Royal Orders of December 22, 1777 and January 20, 1778; to which end the necessary orders have been issued.<sup>21</sup>

In accordance with these terms the collection of the extra impost began, and with this as security the Tribunal raised the loan of \$1,000,000.<sup>22</sup> In approving the Viceroy's report,<sup>23</sup> Gálvez stated that the King had ratified the decision not to raise the price of quicksilver because of the miners' generosity and also that "His Majesty hopes that Your Excellency (the Viceroy) will see that the said \$1,000,000 is returned to the Tribunal as soon as possible in order that the added impost of four grains per marc of silver may cease."<sup>24</sup> This pious hope of the King was echoed loudly by the Tribunal when the Viceroy forwarded his Order to it.<sup>25</sup>

As was to be expected, this loan was not repaid as promptly as the Tribunal and, on the surface, the King had hoped. Three years elapsed, and, whether because of the disappointing Peace of Paris or merely the usual poverty of the Spanish

<sup>21</sup> *A.G. Minería*, vol. 47, exp. 10, Doc. No. 15; the Royal Orders referred to are the ones approving the *Acta de Erección* of the Tribunal.

<sup>22</sup> *Op. and loc. cit.*, Doc. No. 19; the account showing how this sum was raised is in *A.G. Minería*, vol. 63, ff. 145-146; eighteen persons and corporations loaned amounts ranging from \$4000 to \$200,000.

<sup>23</sup> Mayorga to Gálvez, Aug. 10, 1782; *A.G. Virreyes*, Ser. II, vol. 10/131, No. 1760; *A.I., Sec. 5, Aud. de Méx.*, Leg. 2241.

<sup>24</sup> Gálvez to Mayorga, Feb. 27, 1783; *A.G. Cédulas*, vol. 124, No. 48; the group in Mexico which had opposed the new levy continued their objections, sending a number of representations to Gálvez in September-December 1786, protesting both against the new tax and the proposed increase in the price of quicksilver (*A.I., Sec. 5, Aud. de Méx.*, Leg. 2241). This group styled themselves attorneys for a number of the *Diputaciones Territoriales*, but Lassaga and Velásquez de León charged that it was a group of malcontents led by the Fagoagas and D. Manuel de la Borda; they said the Fagoagas blamed them for the loss of their concession of the assay office (the *Apartado*) while Borda, son of the famous José de la Borda, was put out because the Tribunal would not loan him \$100,000 on his own terms (Lassaga and Velásquez de León to Gálvez, Aug. 2, 1782, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2241). Whatever the rights in the case, it is evident that there was already some feeling against the Tribunal.

<sup>25</sup> Tribunal to Viceroy, 11/27/1783; *A.G. Minería*, vol. 48, exp. 1, Doc. No. 13, f. 14.



Crown, the loan was still outstanding and the extra tax continuing. Hence it was natural that the patience of the Tribunal should at length begin to wear thin and that it should take steps to procure repayment of its loan. On May 12, 1785, the Tribunal wrote to the audiencia which was administering the government ad interim requesting repayment of the \$1,000,000 in accordance with the royal order already quoted. The request was acknowledged by the audiencia on May 19th in a most cordial letter expressing the highest esteem and appreciation for the patriotism and service of the Tribunal and promising that just as soon as the funds of the Treasury, at the moment insufficient, permitted, payment would be made.<sup>26</sup> Two days later, however, a second note stated definitely that the loan could not be repaid at that time and enclosed a statement of the fiscal of the treasury showing its depleted condition.<sup>27</sup> The Tribunal was not satisfied with these replies and apparently had good grounds for insisting on some payment. The text of its next insistent request is missing, but the purport and the success of this effort are manifest from the reply:

In view of what you expound in your dispatch of the seventh instant, that the million pesos which you supplied to the Royal Treasury in the emergency of the last war should be repaid according to the terms which you express; this Royal Audiencia has determined: that, since the affairs of the expedition which is being made for the aid and financial assistance of the overseas possessions have been transacted in conformity with what has been determined and ordered, there should be paid a half million pesos to the credit of your account from the first funds which enter into this Royal Treasury, in order to equalize it with that paid the Tribunal of the Consulado; in accordance with which the necessary orders have been given this day to the Treasury Officials; you should understand that both Tribunals are viewed by this Government with the consideration

<sup>26</sup> Audiencia to Tribunal, May 19, 1785; *A.G. Minería*, vol. 48, exp. 3, Doc. No. 6, f. 64; the request of the Tribunal is missing, but is referred to in this reply.

<sup>27</sup> Same to same, May 21, 1785, *ibid.*, Doc. No. 8, f. 66.

which corresponds to their respective services to the King and the Public; and that in this connection and in regard to the prior payment to the said Tribunal of the Consulado, it was made only because their request was the first which was presented at the office, as shown in the decrees which are to be found in those files; it was not necessary that you should make the charges of preference which you manifested; and this Government desires and orders that these shall not continue and that even the most remote motive which might cause disputes between such respectable bodies whose union and harmony are of such interest to the well being of this Kingdom should be avoided.<sup>28</sup>

To the Tribunal de Minería.

June 9, 1785.

Having gained this apparent victory the next step of the Tribunal was, quite properly, to seek to reduce the burden of the extra four grains per marc of silver imposed on all metal brought to the Mint. In accordance with this purpose, the Tribunal wrote the new Viceroy on August 26, 1785, requesting that this special contribution should cease as of September 1st. It stated that since being in force this levy had produced more than the \$50,000 a year necessary to pay the interest on the \$1,000,000 and that there was a considerable surplus on hand with which to continue the interest payments; hence it requested that the collection of this contribution be suspended until this surplus should be exhausted.<sup>29</sup> In accordance with this request the Viceroy decreed that the impost should cease on November 1st; and that, if the surplus was exhausted by the payment of interest before the principal of the loan had been paid, the Tribunal should notify the Viceroy a month in advance so that steps might be taken. It was further stated that the repayment of the \$500,000 should proceed according to the previous orders, payment being made to the Tribunal for distribution to the creditors who had loaned the money.<sup>30</sup>

<sup>28</sup> *Ibid.*, exp. 3, Doc. No. 9, f. 67.

<sup>29</sup> This document is missing but is referred to and summarized in the two replies below.

<sup>30</sup> *Ibid.*, Docs. Nos. 15 and 19, ff. 73 and 77.

The later history of this loan and its repayment lie outside the period covered by this chapter. We will return to it — and other similar ones — later on; suffice it to say here that the promise of immediate payment of the \$500,000 was little more than a gesture and that by 1790 only \$210,000 had been repaid out of the whole \$1,000,000.<sup>31</sup> What is of immediate interest is that in November 1785, while these idle promises were being made, the crown called on the Tribunal for a further gift of \$100,000. This request was embodied in a royal order of November 25, 1785, instructing the Viceroy to procure contributions of \$100,000 each from the Tribunal and the Consulado to help pay the expenses of a general peace with Morocco — “which would be of benefit to all the subjects of these Kingdoms and the Indies.”<sup>32</sup> This request was forwarded to the Tribunal and acknowledged by it without comment on May 6, 1786.<sup>33</sup> Apparently the Tribunal had learned its lesson and was not as ready as previously to give freely of its funds; furthermore, the embarrassing condition of the Mining Fund was beginning to be evident at this time. At all events, as we shall see below, it took a long time and great pressure to wring this sum from the miners.

Considerable space has been devoted to this matter of gifts and loans for several reasons. In the first place, the burden imposed by them on the funds of the Tribunal was a heavy one and must always be kept in mind when passing judgment on its financial management. Although devoted to purposes entirely foreign to the objects of the fund, these sums formed an obligation of the Tribunal and the interest on them formed a fixed charge against its income. As has been suggested, it proved difficult to persuade the government to repay these loans, and hence the Tribunal found itself powerless to liqui-

<sup>31</sup> Cf. below, chap. viii, p. 371.

<sup>32</sup> *A.G. Cédulas*, vol. 132, No. 175.

<sup>33</sup> Tribunal to Viceroy, May 6, 1786; *A.G. Minería*, vol. 48, exp. 4, Doc. No. 15.

date its obligations or remove the added burden on the industry made necessary to cover the interest.

The other result of this burden had, perhaps, a more direct bearing on the fulfillment by the Tribunal of the objects of its creation. We noted above that except for \$329,000 (of which \$300,000 was used for the gift to the King), there are no records in the General Account of funds received at interest by the Tribunal to form a capital fund for the aid of the mines of the country. The reason the \$1,000,000 raised for the loan to the crown does not appear in the receipts is presumably due to the Viceroy's instructions in his letter of August 1, 1782, not to include such sums in the regular accounts.<sup>34</sup> But the fact remains that all in all something over \$1,300,000 was borrowed by the Tribunal, secured as to principal and interest by its income from the regular and supplementary levy on all silver brought into the Mint. Hence a large percentage of the capital envisaged by Lassaga and Velásquez de León actually was raised. But instead of being used to rehabilitate the mines of Mexico, it was virtually all sent out of the country. It was natural that having assumed the liability of principal and interest on these amounts (even though the \$1,000,000 was presumably to be repaid by the Crown), the Tribunal should not raise other large capital sums for the proper purposes of financing mines.

This diversion of capital raised by the Tribunal forced a reorientation of the *Banco de Avíos* and the method of financing mines. Instead of having a substantial capital with the interest thereon covered by a regular income, the bank was limited to this same income as a source for loans to mines. It would seem that these facts should have impressed the Tribunal with the necessity of being unusually careful in the expenditure of its funds, in order that as large a reserve as possible might be built up for the financing of mines. That

<sup>34</sup> Cf. above, p. 96.

this was not the case is evident from further examination of its accounts.

Before taking up the expenditures there are a few items of receipts which we have not yet considered. As pointed out above, Items 4, 5, and 6 represent the only capital funds received by the Tribunal except as indicated in the discussion of the loans. Item 7 indicates that the Tribunal was unable to raise the full million pesos from outside sources and made up the balance of 110,000 pesos from its own regular funds; hence it was entitled to the interest thereon, paid out of the extra impost of four grains per marc.<sup>35</sup>

The next Item, 8, records the profit from capital advanced to the mines. It will be remembered from an earlier chapter that it had been the custom of the private *Bancos de Plata* to take the silver from the mines financed at a discount from the regular price, realizing thereby their profit on the investment. Here we find the bank of the Tribunal following the same practice, and hence this \$26,827 must be considered as interest received by the bank and not as return of principal loaned.<sup>36</sup> In his audit, Monterde ordered a further sum of \$448.03.06, credited as receipts under this heading, as the records showed that this sum had been added as premiums to the cost of goods supplied the miners but not included in the total.<sup>37</sup> Furthermore, the auditor subjected this whole item

<sup>35</sup> The record of this payment of 110,000 pesos does not appear either in the General or the Extraordinary Account—perhaps for the same reason that none of the details of the million pesos are recorded; but it appears on the account showing how the million pesos was raised; cf. above, p. 97.

<sup>36</sup> Cf. the premiums recorded in the summary Account of Avíos at p. 130, below.

<sup>37</sup> After the General and Extraordinary Accounts were presented to him, Monterde audited them carefully and compiled two lists: the first of sums which, in addition to those listed under "Receipts" in the General Account, should be credited to the funds of the Bank; most of these credits consisted of sums charged as expenses by the Tribunal but disallowed by the Auditor for the reasons given in each case. This list, or audit, is found in *A.G. Minería*, vol. 63, ff. 162-185, and will be cited hereafter as *Audit: Credit*, with the number of the item concerned and the pages on which it is found.

The second list is similar to this, albeit much shorter, but consists of addi-

to severe criticism. He stated that originally it had only been proved by a certificate given by the secretary of the Tribunal and based on the two books kept by the factor for charging and crediting the sums involved in the financing of the various enterprises staked by the Tribunal. The auditor requested that the books themselves be sent him for his examination, and then says in his request:

The Tribunal did this and thereby it has been possible to verify the correctness of the said amount credited, but this work has proved useless and without the desired effect; since the accounts in these books were kept with little care, it has proven to be morally impossible to verify from them the truth since they do not present the figures and accounts which the administrators and interventors of the enterprises financed should have rendered to the Tribunal; for which reason the said sum has been allowed in the account temporarily with this remark, reserving its verification until the said accounts are presented, on which subject, the auditor has written to the Viceroy a special dispatch on the importance of their being put in his hands.<sup>38</sup>

This is the first strong evidence of the irregular manner in which the Tribunal kept its accounts — which is particularly impressive because it involves the primary function of the bank's creation — the financing of mines.

The next entry in the General Account of receipts (Item 9) is self-explanatory; virtually all of it was paid out as interest after the extra impost ceased on November 1, 1785.<sup>39</sup> Item 10 of this Account requires some explanation. Don Aniceto del

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tional sums which the Auditor ordered charged against the funds of the Bank as legitimate expenses; the list will be similarly cited as *Audit: Debit*. The entry to which this note refers is *Audit: Credit*; Item 1, ff. 162-163.

<sup>38</sup> In addition to the two lists described above, Monterde drew up a detailed critique of the accounts rendered by the Tribunal. In this he put down his observations and criticisms concerning many of the items of expense to which he objected, although he had decided to allow them to stand in the account, at least for the time being. This report is in *A.G. Minería*, vol. 63, ff. 200-255, and will be cited hereafter as *Monterde's Report*, with the number of the paragraph and page concerned. This reference is to Sec. 1, at f. 200.

<sup>39</sup> *A.G. Minería*, vol. 63. Cf. above, p. 99.

Barrio served as factor of the Tribunal from its establishment until September 1, 1784, and in this position had in his charge a large part of the funds of the bank.<sup>40</sup> In September 1784, the deputy-general, Don Julián Antonio del Hierro, made an examination of his accounts and found a shortage variously computed as between \$125,000 and \$180,000.<sup>41</sup> This shortage forms part of Item 75 of the Expense Account, and the manner in which it occurred, together with the gross negligence of the Tribunal in the matter, will be fully discussed when we reach that item. Here it is sufficient to note that the goods of Don Aniceto were seized to satisfy this shortage and this entry in the receipts of \$15,518.05.01 represents the amount realized by their sale.

The final entry in the record of receipts — the sum received from the sale of copies of the Ordinances — is sufficiently clear, but nevertheless drew some unfavorable comments from the auditor. He stated that there were no vouchers for this entry; and when he requested documents showing the number of copies sold in Spain, the number distributed officially, and the resolution setting the price at which the factor should sell the balance, he was told that there were no such records.<sup>42</sup>

This completes the receipts of the *Tribunal de Minería* from its founding up to June 30, 1787, except for the fund of one million pesos already noted as raised for the loan to the crown. It is true that, as we shall see below, the Fund was credited by the auditor with additional sums amounting to over \$200,000; but they were in the nature of refunds on account of expenses disallowed and did not constitute real receipts.

<sup>40</sup> *Audit: Credit*, Item 14, *A.G. Minería*, vol. 63, f. 175.

<sup>41</sup> *Testimonio de Votos Secretos de Don Julián Antonio de Hierro*, No. 25; *A.G. Minería*, vol. 110, f. 383. This document is a certified copy of a record kept by this Deputy of his vote or opinion on matters in which he disagreed with a majority of the Board. It is a most valuable record, and was produced by his son to clear his father from responsibility for the irregularities of the Tribunal. The document will be cited hereafter as *del Hierro: Votos Secretos*, with the number of the paragraph and folio concerned.

<sup>42</sup> *Monterde's Report*, Sec. 2, *A.G. Minería*, vol. 63, f. 201 b.

We now come to the report of expenses — showing how all this money was spent. For the light it sheds on the manner in which the funds of the Mining Guild were administered by its trustees — the members of the Tribunal — this record is more valuable than that of the receipts, both on its own account and because of the enlightening and often caustic comments it drew from the auditor. By taking up the items as they occur in the account, together with the further information regarding them supplied by Monterde, we will gradually build up a picture of the manner in which the Tribunal performed its task; its general character will become evident from its particular action in specific cases.

Items 1 to 33, amounting to slightly over 284,000 pesos, are mostly self-explanatory and require little comment. They comprise the regular salaries and wages paid to the officials and employees of the Tribunal. Although the salaries of the deputies were not specified in the Ordinances, they had been listed in the Representation of 1774, and hence implicitly approved by the King, and the others were established by the Tribunal in accordance with Titles I and XVI of the Ordinances. It may be noticed that no salary appears for the factor, Don Aniceto del Barrio. This was because of the shortage in his accounts which persuaded the Tribunal in seeking repayment of the sums he owed not to credit him with any salary.<sup>43</sup> The payments to the officials of the Mint, although apparently not formally authorized by the Ordinances, were justified as this office had the duty of collecting the Tribunal's income. With one or two exceptions, the auditor passed over these salary items with little comment. There were a few minor adjustments and Monterde criticized a number of the items, notably the payment of \$10,530.03.03 to Velásquez de León as assessor, pointing out that at the time of the organ-

<sup>43</sup> Based on an *informe reservado* from the Tribunal to the Viceroy, dated Mar. 30, 1786, and quoted in *Audit: Credit*, Item 14, *A.G. Minería*, vol. 63, f. 171.



ization of the Tribunal the appointment of an assessor had been suspended and the duties entrusted to the director, presumably to save money.<sup>44</sup> Any general observations as to whether the various officials and employees earned the large sums paid them for their services to the mining industry, or whether the whole organization merely existed for the benefit of a few individuals at the expense of the industry generally must await the conclusion of our study.

Leaving these regular items of expense, we come to what might be termed the nonrecurring, and in some cases highly irregular, expenditures. The first of these to engage our attention is Item 34, which in the form in which it appeared in the account gave no information as to the manner in which this considerable sum was spent. This fact did not escape the auditor, and in his report he complained of the absence of any accounting by Subiaur as to how he spent the money. Even more strongly he objected that \$4674 of this sum was paid to Subiaur by virtue of an order to the factor signed by Lassaga alone — "which is expressly contrary to Art. XI, Title 16 of the Ordinances . . . and is a pernicious custom introduced with notorious damage to the funds of the Bank."<sup>45</sup> As we shall see, this is but the first of many instances of this particular irregularity. Item 35 can be passed over, but the next one drew forth the same criticism as that above — with the added censure of the Tribunal for not having required the factor to make good the sums which he had paid out by virtue of such private orders.<sup>46</sup> Item 37 was found to have been paid without any formal authorization.<sup>47</sup> With Item 38 we come to the first of several entries which seem to have been for purposes very distantly connected with mining, to say the least. The

<sup>44</sup> The adjustments and comments touching these items occur in *Audit: Debit*, Items 1-20; *Audit: Debit*, Item 2, and *Monterde's Report*, Secs. 3-8, all in *A.G. Minería*, vol. 63, ff. 163, 185-195, 202-205.

<sup>45</sup> *Monterde's Report*, Sec. 9, *A.G. Minería*, vol. 63, f. 205 b.

<sup>46</sup> *Ibid.*, Sec. 10, f. 206 b.

<sup>47</sup> *Ibid.*, Sec. 11, f. 207.

expenditure of 3570 pesos for masses to the Virgin was, however, a perfectly usual custom in those times in Mexico, and even the critical Monterde found no fault with the expense itself, but only with the form, pointing out that there was no formal authorization of the expense nor vouchers testifying to it.<sup>48</sup>

If this expense could be justified by the circumstances of the epoch, the next two items show a naïve prodigality on the part of the ministers which is so typically Latin that it is amusing to come on the entry in a blurred eighteenth-century manuscript — especially when one learns that one of the bull-fights never took place! While Monterde did not seem to consider the purpose of these expenditures unwarranted, he did criticize the irregularities in their authorization and accounting.<sup>49</sup> Because of these facts the Item was only allowed conditionally.<sup>50</sup> A large part of the expense in both cases went for wine and sweets for the members.

Item 41 requires no comment and the next two can again be considered together. Of the 8000 pesos \$357.05.06 was disallowed as “not having been spent on business proper to

<sup>48</sup> *Ibid.*, Sec. 12, f. 207 b.

<sup>49</sup> *Audit: Credit*, Item 3, *ibid.*, f. 164. *Monterde's Report*, Sec. 13, *ibid.*, f. 209.

<sup>50</sup> *Ibid.*, Sec. 14, f. 210. It may seem surprising that when he threw out large expenditures which, even if they were irregular, were at least connected with mining, Monterde should have allowed these frivolous items to remain except for 400 pesos. It is probable, however, that the Tribunal could not have avoided the expense even if it had wished to. These “testimonial” bull-fights are still to be met with. The writer observed an almost exact parallel of this while in Mexico in April 1933. A bullfight was held to raise money for the “Monument to the Revolution” — i.e., the National Revolutionary Party. It was announced that the best fighters in the world would perform, and that the President, Cabinet, and Diplomatic Corps would attend — as in fact they did; it was a brilliant occasion. What was not announced publicly was that every government employee, no matter how humble, was required to buy a ticket in advance, and every foreign legation compelled, diplomatically of course, to take a box. (Characteristically, this was not deemed a proper diplomatic expense by the United States Government and in order to prevent the appearance of an insult, the members of the Embassy Staff had to bear the considerable expense personally.) As in 1933 it was unwise to offend the P. N. R., so in 1783 it was necessary to honor the Viceroy.

the funds of the Bank," half of it again having been due to a private order of Lassaga.<sup>51</sup> Aside from this deduction, Monterde objected to both expenditures on the ground of lack of proper vouchers or resolutions authorizing the disbursements. In regard to the 8000 pesos, it appears that an account of how the money was spent and the balance remaining was furnished the Tribunal in 1782, but not examined by the latter until 1786! Hence at the time the account was made up the balance due from the estate of Muniain had not been collected, and Monterde observed that until it was collected the ministers who neglected to check the account should be held responsible. He also stated that no account whatever of the expenditure of the 10,000 pesos sent in 1784 had been produced — in fact there were no documents touching this payment except a letter from Escolano acknowledging receipt of the sum; the production of these documents forthwith was demanded.<sup>52</sup>

The next few items, all for small sums, require no comment; many of the vouchers referred to are missing and it is not possible to learn what these expenditures were for. It appears, however, that Item 50 represented the price of a Spanish translation in sixty folio volumes of the Encyclopaedia, subscribed to by the Tribunal for the College.<sup>53</sup>

In reference to Item 60 the auditor's comments are particularly revealing as to the slipshod way in which the funds were handled. These were as follows:

In reference to Item 60 of the General Account amounting to 1,765 pesos, the following charges must be made: Why were there

<sup>51</sup> *Audit: Credit*, Items 4 and 5, *ibid.*, ff. 164 b — 166.

<sup>52</sup> *Monterde's Report*, Secs. 15-16, *ibid.*, ff. 212 b — 214.

<sup>53</sup> *Ibid.*, Sec. 18, f. 215. It is not stated what encyclopaedia this was. The manuscript simply says, "la enciclopedia que ofrecio publicar, traducida al Castellano, don Antonio Sanchez, mercader e impresor de Madrid." If it was the famous one of Diderot, which, given the date, seems possible, it is most interesting that a semi-official body under the protection of the King of Spain should have subscribed to this work for use in the Royal School of Mines. It certainly indicates that the Tribunal was free from clerical domination.

not demanded the documents which should prove the items which formed the memorandum submitted with this entry? Why was not this sworn to by Arrieta? Why was there no objection to the expenditure of eighty pesos by virtue of a verbal order of the Administrator, Lassaga, which in the two first items of this memorandum are said to have been expended in the acquisition of the "red metals" for assaying, without it being said to whom these were given or in what form? And finally why was there not required from Arrieta the orders by virtue of which he incurred all the other expenses described in this memorandum except the two first items paid only by virtue of a verbal order of the Administrator? <sup>54</sup>

We do not know what the individual expenditures making up this sum were, but apparently they were a collection of small accounts. Items 61 to 68 are all minor expenses passed by the auditor with only routine recalculations of the amounts.

With Item 69, however, we reach the point where wholesale disallowance of Items charged as expense begins. Both this and the succeeding payment to Lassaga were disallowed in full by Monterde and ordered credited to the funds of the Bank. This was done because the records did not show their authorization by the Tribunal, nor any evidence that the money was spent on the legitimate business of the Tribunal.<sup>55</sup>

Item 73 is a substantial amount and was allowed by the auditor, but only after serious criticism which throws considerable light on the Tribunal's administration of its funds. It appears from his discussion of the transaction which gave rise to this expense that the total was broken down as follows, and explained below:

\$ 7,000. 0	as part of the purchase price of \$31,000
10,200. 0	as interest on the balance from December 1, 1778 to June 30, 1787
10,200. 0	as the expense of various necessary repairs and alterations to the building

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\$27,400. 3

<sup>54</sup> *Ibid.*, Sec. 24, f. 220.

<sup>55</sup> *Audit: Credit*, Nos. 7 and 8, ff. 166 b — 167 b.

In the autumn of 1778 the Tribunal secured an option to purchase for the use of the School of Mines a building belonging to the Augustinian Fathers at the price of \$31,000. The local head of the Order, however, did not have authority to dispose of the property, and hence he was forced to seek permission from Spain. In the meantime an arrangement was entered into which was signalized by a contract between the Tribunal and the Province of the Order dated November 16, 1778. Under this the Tribunal made a down payment of 7000 pesos and acknowledged an additional 24,000 pesos as payable if and when the license to sell should arrive within two or three years; if it should not arrive the 7000 pesos should be returned. While awaiting this license, the Tribunal was permitted to make such alterations as might be necessary to convert the building to the uses of the College. Furthermore, if the license to sell were denied, the Tribunal was to continue to occupy it under lease for a period of nine years; if at the end of this time the Tribunal should wish to continue to use the building and the Province should refuse, the latter should take it back in the condition it had been put in by the Tribunal; if, on the other hand, the Tribunal relinquished the building voluntarily, it should be bound to return it in the condition in which it should have received it. Furthermore, in the case of refusal of the license to sell during the nine years or such longer period as the Tribunal might occupy it, all repairs which the property might need were to be at the cost of the Province. In the meantime, the Tribunal should pay the Province 1200 pesos a year. This was to be considered as rent if the sale was not consummated; if the sale was completed, the payment was to be considered as interest on the 24,000 pesos unpaid balance of the purchase price. All these complicated conditions left the auditor with considerable confusion as to whether, at that time, the property belonged to the Tribunal or was simply occupied under lease from the Province. These considerations led Monterde to make some

pungent comments on the whole transaction in the following terms:

Having presented substantially the terms on which the Tribunal holds the College building, the Auditor makes the following objections concerning the item of expense which gave origin to this note: First, that there is no evidence of a formal resolution authorizing the purchase of said property; second, that there does not appear evidence of an appraisal nor of an attempt to secure a lower price or more favorable circumstances for the purpose which was to be given it; third, from what appears in the entry marked by the No. 3, in the evidence taken from the private record of the Deputy General, Don Julián del Hierro, the agreement or contract was made solely by Don Joaquín Velásquez; which circumstance, as well as the high price, caused the said Hierro to oppose it repeatedly; fourth, that the preëemptory term of two or three years within which the license of the President was to be obtained, and considerably more time, has passed, and it is to be noted that the sale has not been consummated nor has there been returned to the Bank the seven thousand pesos which was paid with the express condition of being a payment on account while the Province did not have the authority to alienate the property; fifth, that there are continual repairs on the building at the expense of the Bank, whereas, since the purchase has not been consummated owing to the fault of the Province, the latter should have executed these; sixth, that the \$10.229.03. 0., which was spent in the renovation of the building to make it into a College is only authenticated by two accounts or records given by the said Deputy General del Hierro, without these being sworn to or being accompanied by the documents which proved them, there being missing also the resolution which there should have been authorizing this work; . . . and finally, since from all this it results that that lease was very burdensome on the funds of the Bank and that that building has caused the actual expenditure of more than 27,000 pesos, and in addition, the obligation of the principal and interest on the 24,000 pesos, without it having been, up to the present, of any use whatsoever to the body of miners, the propriety of this transaction is not apparent; which objections the auditor recommends should be considered seriously and carefully in the resolution of this judgment.<sup>50</sup>

<sup>50</sup> *Monterde's Report*, Sec. 25, *ibid.*, ff. 221-226 b.

As indicated in this report, the Deputy Julián Antonio del Hierro had opposed this transaction. In his private record he tells us that Velásquez had been authorized to negotiate for a suitable building; and that when he came back with this proposition he, del Hierro, opposed it repeatedly because of the price, especially as the Count of Regla had just bought a larger and better house for 24,000 pesos. But he tells us his protests were in vain, and the members of the Tribunal voted to accept the proposition of Velásquez on November 17, 1778, paying the 7000 pesos and assuming the obligation for the 24,000 pesos.<sup>57</sup> This expenditure is an excellent example of the lax handling of its finances by the Tribunal. The purpose for which the expense was incurred was a proper one — unlike some of the other expenditures; but the handling of the transaction was clearly careless and extravagant.

The next Item is self-explanatory, referring to Items 4 and 5 of the Account of Receipts. Minor corrections in the amounts were made by the auditor,<sup>58</sup> and in his report he criticized the whole entry. He objected that no reasons were given to justify the borrowing of these sums and burdening the funds of the bank with the interest thereon.<sup>59</sup> Since it had been intended at the foundation of the bank that capital should be borrowed at interest, it is curious that this objection should be made. Perhaps it was because the money so borrowed was used for purposes other than the direct financing of the mines.

The next three Items together make up over four-fifths of all the expenditures of these ten years and must receive our careful attention — as they did that of Monterde. In the form in which they appear on the General Account, they give little information of value, and hence must be broken down into

<sup>57</sup> *Del Hierro: Votos Secretos*: No. 3, *A.G. Minería*, vol. 110, f. 375. From this, Monterde's first objection loses force, as, although the formal resolution was not produced, the Tribunal did vote the purchase.

<sup>58</sup> *Audit: Debit*, Nos. 22 and 23, *A.G. Minería*, vol. 63, f. 197.

<sup>59</sup> *Monterde's Report*, Sec. 26, *ibid.*, f. 226 b.

their component parts. Item 75 is meant to cover various expenses incurred by the Tribunal which were to be paid back to the bank by the individuals concerned. The account showing the separate sums which made up this entry as is follows:

LIST OF THE CURRENT ACCOUNTS DUE THE  
TRIBUNAL DE MINERÍA UP TO JUNE 30, 1787  
(Item 75 General Accounts)<sup>60</sup>

- |  |               |
|--|---------------|
| Item 1. The amount owed by Sr. Velásquez de León: being 1,000 pesos given him for the purchase of instruments and supplies for the School of Mines as shown by the voucher of November 21, 1778; and four thousand pesos which were loaned him under voucher of the eighteenth of March, 1779.   | 5,000. 0. 0   |
| Item 2. Amount owed by Don Juan de Salezán, according to a document which, together with a file formed to collect it, is in the hands of the Superior Government.  | 3,009. 02. 0  |
| Item 3. Due from Antonio Rodriguez Velasco to whom the sum was given for the boxes destined for the Tribunal for the bull-fight which was to have been held at the beginning of the year 1784 and which did not take place; for which reason this sum should be returned.  | 3,090. 0. 0   |
| Item 4. Due from the heirs of the late Don Julian del Hierro who was indebted in this amount for various commissions which he held from the Tribunal.  | 1,085. 0. 0   |
| Item 5. The shortage which was found to exist in balancing the accounts of Don Aniceto del Barrio up to the first of September, 1784, less the sum of ten thousand pesos which he paid to Don Miguel Pacheco Solis for Avíos and which is charged to the Latter's account with the Tribunal, the latter reserving a claim against Don Aniceto. | 126,938. 2.10 |
- Note:* This account is accompanied by a memorandum which shows the value of the goods and current debts due Don Aniceto and which have been attached for the payment of this shortage.

<sup>60</sup> *A.G. Minería*, vol. 105, ff. 364-365.



Item 6. The shortage resulting from the balancing of the accounts of the Factor, Don José Manuel Arrieta up to February 9, 1787.

17,457. 2.02

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Total \$ 156,579. 7.02

Monterde's report, which disallowed the entire amount, throws more light on the individual items. As indicated in the accounts, the first item included two payments to Velásquez de León. The Deputy del Hierro recorded the first of these and said that if the commission was not carried out the sum was to be repaid by Velásquez.<sup>61</sup> Monterde refused to allow it as a legitimate expense as there were no vouchers concerning it, and no evidence of the actual purchase of the instruments, which he said, quite justly, should have preceded payment for them.<sup>62</sup> The loan of 4000 pesos, made to Velásquez on March 18, 1779, was secured by his salary and the products of a certain mine; and, in addition, each of the other ministers (Lassaga, Anza, del Hierro and Liceaga) made himself responsible for one-quarter of the amount if Velásquez did not repay it himself.<sup>63</sup> Monterde also disallowed this item, saying that the Ordinances gave the Tribunal no authority to make such loans, and, further, because it had not been repaid and the Tribunal had failed to deduct it from the salary due Velásquez at the time of his death. Hence he ordered that the four Ministers (or their estates) who guaranteed the loan should be held responsible for the payment of the four thousand pesos.<sup>64</sup> Items 2, 3, and 4 were disallowed for the same general reason that the members of the Tribunal were at fault for not having demanded repayment before the accounts were closed.<sup>65</sup>

We now come to the Item which forms the biggest part —

<sup>61</sup> *Del Hierro: Votos Secretos*, No. 5, *A.G. Minería*, vol. 110, f. 376.

<sup>62</sup> *Audit: Credit*, No. 9, *A.G. Minería*, vol. 63, ff. 167 b-168.

<sup>63</sup> *Del Hierro: Votos Secretos*, No. 6, *A.G. Minería*, vol. 110, f. 275.

<sup>64</sup> *Audit: Credit*, No. 10, *A.G. Minería*, vol. 63, ff. 168-169.

<sup>65</sup> *Ibid.*, No. 11, ff. 169-170, No. 12, f. 170, No. 13, f. 170.

\$126,938.02.10 — of this entry in the General Account. This has been referred to briefly before and comprises the shortage which was found to exist in the account of the Factor, Don Aniceto del Barrio. That the Tribunal should have been so naïve as to include as one of its legitimate expenses the shortage in the accounts of one of its employees in itself is evidence of its irresponsibility. This evidence is supported by Monterde's logical exposition of his reasons for not admitting the Item, which in itself forms such an enlightening indictment of the incompetence and negligence of the Tribunal in financial matters that it deserves to be quoted. After explaining briefly what the sum represented, and summarizing the provisions of the Ordinances in regard to the safeguarding and responsibility for the funds of the bank,<sup>66</sup> Monterde wrote:

The exaction assigned as the income for the Bank began on January 13, 1777 and the Tribunal was established on May 24, 1777. Immediately there should have been observed those well-thought-out precautions and the good administration proposed in the said representation and consequently included in the Ordinances. It was not done thus; since the said Don Aniceto had charge of the office of the Factor from the said year 1777 without there being received from him then, or at any other time, any bond whatsoever. Neither was the vault with four locks for the safe custody of the great body of the funds set up then or at any time since; far from taking care that only the amount necessary for the current affairs of the Bank should be left in charge of the said Factor, there was handed to him and left in his power without order and with little attention considerable sums . . .

From what has been shown thus far, it is clear that the shortage of the said Factor originated from the little care and incredible disorder of the Tribunal and that in consequence the Funds of the Bank should demand this sum from the Ministers who composed it. But there are even other reasons which must be brought forward; and they are that neither did the Tribunal take the proper annual accounts and inventories of the stores or chests, and that the Tribunal omitted to examine the accounts of the said Factor until the end of August 1784, when he was found to be short; showing

<sup>66</sup> Ordinances, Tit. 16, Arts. 5-7.

that there was a complete forgetfulness of that represented to His Majesty in Section 60 of the Representation of 1774, and in consequence ordered by the King in the Royal Ordinances; and it must be noted carefully and kept in mind . . . that in the copy which has been made of the Book which Don Julian del Hierro kept in his house to record his votes in the affairs of the Tribunal, it is shown in Nos. 2 and 25 that as soon as the Factor Don Aniceto was named, the said Hierro and Don Thomas Liceaga insisted repeatedly that the proper bond should be given, and that when the accounts of the said Factor were examined in September 1784 by the said Hierro, he found that many of the disbursements had been made with the authorization of the President Administrator alone; he complained of this and although it was thought that the Tribunal should ratify these disbursement orders, it was not decreed thus; because of which, neither can the audit and the judgment which is formed of this account in which it is said there is found a shortage of \$186,000.00 and some odd pesos, admit it; noting finally, that it was not wished to take action concerning this notwithstanding the demands which the said Deputy General made in 1785. Thirdly, that according to the memorandum appearing at ff. 166-168 of the Book of Vouchers of expenses, it appears that among other persons who owed money to Don Aniceto, the Director, Velásquez de León owed \$8,022.05.00, and the Administrator Lassaga, eight thousand and four pesos; and finally there must be noticed the Royal Orders repeatedly cited of June seventh and August 19, 1786. All of which makes clear the justice with which this considerable sum is credited to the funds of the Bank against the Ministers who composed the Tribunal to whom remains the right of salvage against the effects of the said Don Aniceto (the sum credited to the funds of the Tribunal being \$126,938.02.10).<sup>67</sup>

Although the facts disclosed by this item alone are sufficient to brand the Tribunal as incompetent and grossly negligent in its handling of the affairs of the bank, general comment on this subject will be more appropriate after we have completed consideration of the accounts.

This particular entry which we have been considering (No. 75) is completed by the sum of \$17,457.02.04. This

<sup>67</sup> *Audit: Credit*, No. 14, *A.G. Minería*, vol. 63, ff. 171-178 b.

item was disallowed by Monterde for much the same reasons as the preceding one. Here, as before, no bonds had been required nor any regular accounting made. Actually this shortage reflects even less credit on the Tribunal than that of Barrio. Not only had the Tribunal failed to learn its lesson, but in this case the factor received his full salary for the period for which he served at the rate of 3000 pesos a year.<sup>68</sup> It should also be pointed out in some extenuation of the factor, but to the greater shame of the Tribunal, that of the total recorded as due from Arrieta, \$15,982.02 was shown to have been advanced to members of the Tribunal, divided as follows:

\$6,681.0.0	to Lassaga
3,550.5.6	to Velásquez de León
4,400.0.0	to Ramón de Liceaga
1,350.5.6	to Lassaga (who claimed to have got it from Arrieta expecting to need it for a certain fee in the name of the Tribunal).

Quite properly, the auditor threw out the whole item, and stated that the various amounts should be collected from the effects of the respective Ministers or their estates, the claim against Arrieta remaining, however, until the shortage should be liquidated.<sup>69</sup>

We have seen from the preceding paragraphs that the whole of this Item 75 of the Tribunal's account was disallowed for reasons which were clearly good and sufficient. The next Item, No. 76, is the largest in the whole account of expenses, and a detailed examination of this does little to create a more favorable impression of this phase of the Tribunal's activities. Although a number of the major items making up this extraordinary expense have already been discussed, it is proper that the full account be included at this point.

<sup>68</sup> See above, *General Accounts, Expenses* — Item 16.

<sup>69</sup> *Audit: Credit*, No. 15, *A.G. Minería*, vol. 63, ff. 178 b-180.

## ACCOUNT OF ALL THE EXTRAORDINARY EXPENSES INCURRED BY THE ROYAL TRIBUNAL DE MINERÍA FROM THE YEAR 1777 TO JUNE 30, 1787

(Item 76 of the General Account)<sup>70</sup>

Item I.	Gift to His Majesty for aid of the docks of Guazacualco; the sum having been loaned from the funds of <i>temporalidades</i> and being an obligation of the Mining Fund with interest at 5 per cent	300,000. 0. 0
Item II.	Interest on the above sum from November 11, 1777 to June 30, 1787	144,561. 5. 1
Item III.	A gift made in the year 1780 to the Prince of Asturias which Item was approved by the Royal Order on February 7, 1781	100,000. 0. 0
Item IV.	A gift similarly made in the year 1783, to the Princess of Asturias and approved in a Royal Order on December 27, 1783	50,000. 0. 0
Item V.	The expenses of sending the above two amounts to Vera Cruz	537. 4. 0
Item VI.	The payment on February 17, 1778 to Velásquez de León as compensation for the representations and laborious work which he carried on in the years preceding the formation of the Tribunal de Minería	20,000. 0. 0
Item VII.	Reward paid to Don José Antonio de Alzata on October 14, 1777 for an invention useful to the mining industry	500. 0. 0
Item VIII.	A payment to Velásquez on November 18, 1777 authorized only by Sr. Lassaga for the expenses of the experiment of Don Marco Cendejas	300. 0. 0
Item IX.	A payment made to "Nuestra Ciudad" for aid in the needs caused by the epidemic of small pox in 1779	10,000. 0. 0
Item X.	A payment authorized in 1780 on March 18 to Don Francisco Ignacio de Eraeta destined as a contribution toward the expenses of the Sacristy of this Holy Church	2,000. 0. 0

<sup>70</sup> This account is in *A.G. Minería*, vol. 208, ff. 78-85.

Item XI.	Payment authorized on March 16, 1784 to Lic. Don Silvestre Lopez Portillo as partial remuneration for the heavy labors in the exercise of the commission which was conferred on him for the re-organization of the Real de los Catorce	4,000. 0. 0
Item XII.	Payment on June 14, 1784, to the Count of Saabran as compensation for his expenses in equipping the hydraulic machine which was to serve the mines	1,000. 0. 0
Item XIII.	A contribution made on July 23, 1786 to Don Gabriel Gutierrez de Terrán, Treasurer of the Alms Fund collected as aid to the poor because of the calamity experienced in that year	2,000. 0. 0
Item XIV.	The total paid to the representative of the Marqués de Sonora because of the four thousand pesos annual pension voted him by the Tribunal and approved by the King, from February 18, 1779 to June 30, 1787	33,455.04.05
Item XV.	The expense involved in the casting and engraving of the medals in commemoration of the birth of the twin princes and the Infanta Doña Fernanda	27,405.03.06
Item XVI.	The expenses of the quicksilver experiments carried on at Chápultepec as shown in the particular account rendered by Don Julian Antonio del Hierro	12,807.01.00
Item XVII.	Paid to Don Ramón Luis de Liceaga by two orders of June 9 and August 9, 1781, for the expense of the commission to reconnoiter the quicksilver of the hill of Tepeyoculco in the District of Cuernavaca, as shown by the account presented by Liceaga	414.03.06
Item XVIII.	Paid on July 2, 1780 under the sole authorization of Lassaga to Don Francisco de Rodriguez de Abarca for the discovery of some quicksilver mines	250.00.00
Item XIX.	A similar payment on August 4, 1780 to Don Juan Pedro Chiafeno	400.00.00

Item XX.	A similar payment likewise authorized to Don Miguel Antonio Sanchez on December 14, 1780	300.00.00
Item XXI.	Another payment for the same purpose to the said Sanchez on March 29, 1780 authorized by the Tribunal	300.00.00
Item XXII.	Payment to said Sanchez on October 14, 1780 as compensation for his work of more than three months in searching and examining quicksilver mines authorized by the Tribunal	200.00.00
Item XXIII.	Payment authorized by the Tribunal on April 11, 1780, to Don Pedro de Larra for examining some quicksilver mines	100.00.00
Item XXIV.	Payment authorized by Lassaga on April 2, 1781 to Don Santos Lopez de Yrisarri for expense of quicksilver mines	200.00.00
Item XXV.	Payment authorized by the Tribunal on April 24, 1780 to Don Diego Mariano, attorney for Don Pedro de la Sota, owner of a quicksilver mine in the hill Axuchialan	2,000.00.00
Item XXVI.	Payment to the said Mariano for the same purpose in the same year	2,000.00.00
Item XXVII.	Payment authorized by the Tribunal on September 17, 1781 to Don Vicente Conde for working a quicksilver mine called "El Chapin" in the District of San Luis Potosí.	2,000.00.00
Item XXVIII.	Paid to Don Felipe José de Narvarte for expenses and salaries of the commission which was conferred on him to explore and examine regions having indications of veins of quicksilver	4,233.05.00

*Note:* Of the above amounts entered as expenses for quicksilver, there is no hope of recovering a single real; in some cases because payment was for expenses and in others because payments were as *avíos* for mines and the latter did not come up to expectations because the owners are bankrupt

Item XXIX.	Don Domingo de Busturia received as capital for the quicksilver mine named "Dolores" in the Cerro Blanco, 16,000 pesos which was authorized on January 17, 1781; of which quantity there remains on June 30, 1787, — 13,856.7-5, as shown in the account which has been formed, and which accompanies the voucher which records the payment of 15,000 pesos which, with the one thousand pesos that Don Felipe Narvarte received according to his account, and a letter of Busturia which is in the files, makes up the 16,000 pesos authorized	13,856.07.06
	<i>Note:</i> For the payment of this balance there was seized from Busturia one mine and two mills which have not been able to be sold but in the present year one of them has been rented for 1,500 pesos and there are no other effects to collect on	
Item XXX.	Contributed to the Royal Academy of San Carlos at the rate of 5,000 per year from 1782 — 1787 inclusive	30,000.00.00
Item XXXI.	Paid to Lassaga for a certain private gift of which he informed the Government	6,000.00.00
Item XXXII.	A fee paid to Don Luis del Campo for the reasons expressed in the copy of the voucher at Page 83	1,500.00.00
Total of Extraordinary Expenses		<hr/> \$ 773,332.02.00

The first few items of this account have already been considered above in the discussion of the generous policy of the Tribunal in making loans and gifts. Item VI, the payment of 20,000 pesos to Velásquez as a reward for his services in preparing the Representations and forming the Tribunal, was thrown out altogether. In giving his reasons for disallowing this expense, Monterde stated that no file or formal resolution relative to this payment had been produced, and that there



was no authority for it in the Ordinances. Furthermore, he pointed out that, while there was no doubt that the merit of Velásquez was worthy of reward, it should be remembered that he had been named Director for life with a salary of 5000 pesos per year and also drew 1200 pesos a year as assessor, as well as receiving many other honors.<sup>71</sup> It is interesting to note that the deputy del Hierro opposed this grant when it was made and voted against it.<sup>72</sup> Item VIII was severely criticized, for the familiar reason of lack of proper authorization or vouchers. Item IX, in spite of its laudable purpose, was also criticized. The reasons given are so sound and far-sighted for the period that this brief comment deserves to be quoted in full:

There appears in the same account as Item 9, the sum of 10,000 pesos; the Auditor objects to this item, first, because there does not appear any authorization for its payment, nor is it accompanied by any authenticating documents, except a brief order and receipt which appear at Page 12 of the said volume of vouchers; and secondly, because, although it is undeniable that the purpose for which this money was given was laudable in the extreme, it must also be confessed that the funds of the Bank of which it is a question here are not destined nor appropriate for such needs, to which other bodies must contribute without limit; since, when the funds of all crowd to the help of one single need without method or good order, the particular obligations appropriate to each one are neglected, resulting afterwards in notorious and grave prejudice to the same public which it was desired to help; as in effect is the case at the present time, in which there is seen the neglect of the body of miners, — since no one doubts that the inaction of the latter is due to the lack of aid and habilitation which, besides occasioning severe hardship to them themselves, causes it to be felt by the most humble citizens and the Royal Treasury; all of which is no doubt the reason why expenditures of this nature were held to be irregular in the Royal Order of August 19, 1786.<sup>73</sup>

<sup>71</sup> *Audit: Credit*, No. 16, ff. 180-181.

<sup>72</sup> *Del Hierro: Votos Secretos*, No. 1, *A.G. Minería*, vol. 110. f. 375.

<sup>73</sup> *Monterde's Report*, Sec. 29, f. 228.

Objection was raised to the next item, also a charitable contribution, for the same reasons.<sup>74</sup> While these items were criticized, they were allowed to remain.

Item XI was one of those expenses which had been opposed by del Hierro. He stated that this payment was approved only by the administrator Lassaga and the deputy Villanueva, with himself opposing it because Portillo had not been directly commissioned by the Tribunal but by the governing audiencia. Hence he felt that all the functions which Portillo exercised were as representative of the General Government, whose expenses should not be borne by the Mining Fund. Furthermore, he stated that if Portillo spent anything on the commission, he did so voluntarily.<sup>75</sup> Monterde criticized the payment for the same reasons given by del Hierro, and the added one that it had not been approved by the Superior Government.<sup>76</sup>

Item XIII was another charitable contribution and was criticized by Monterde for the same reasons as the preceding ones.<sup>77</sup> Except for a minor correction of 18 pesos in the amount,<sup>78</sup> the auditor passed over the next item without comment. As the grant to Gálvez had been approved by the King, unlike that to Velásquez, nothing could be said, no matter how irregular the expense might seem.

Item XV, like the one above, put Monterde in a difficult position. The expenditure of this large sum for a purpose not germane to the functions of the Tribunal was clearly improper; yet to criticize it implied disapproval of a demonstration of loyalty and affection to the King. Monterde overcame this difficulty ingeniously. First of all he pointed out that the account submitted by the engraver lacked proper authentication and was drawn up with little method. He then handled

<sup>74</sup> *Ibid.*, Sec. 30, f. 229.

<sup>75</sup> *Del Hierro: Votos Secretos*, No. 13, *A.G. Minería*, vol. 110, f. 377.

<sup>76</sup> *Monterde's Report*, Sec. 31, *A.G. Minería*, vol. 63, f. 229 b.

<sup>77</sup> *Ibid.*, Sec. 32, *ibid.*, f. 230.

<sup>78</sup> *Audit: Debit*, No. 26, *ibid.*, ff. 199 b-200.

the delicate matter of the royal approval in the following neat manner:

This expenditure for the said purpose is said to have been made in accordance with two Royal Orders, one of the twenty-second of April, 1784, which expressed the great satisfaction of His Majesty in seeing the memory of his Royal Munificence perpetuated by means of the medal which it had resolved to strike; and the other of July 24, 1786, in which, acknowledging the receipt of the boxes of the said medals, it is said that they were ordered to be struck with the Royal permission. On which subject, taking into account the later Royal Order of August 19, 1786, in which this expenditure is expressly noted as excessive, it should be said that this latter order was issued with complete consciousness of the former; and for this reason it should be understood that the previous ones gave the royal permission and approval with the understanding of His Majesty that the amount which would be spent in that loyal demonstration would be prudent and in proportion, and in the belief also that their funds were in a very different condition from that shown by the account sent him by the Conde de Gálvez and which the Tribunal had presented to him on March thirtieth of the same year; . . .<sup>79</sup>

In this manner Monterde was able to criticize this unquestionably excessive expenditure without implying any disapproval of the all-powerful wishes of the King.

With Item XVI, we have the first of a number of heavy expenses connected with the production of quicksilver. It will be remembered that quicksilver had long been a royal monopoly, and although the mineral was known to exist in Mexico, its extraction had been forbidden in order to prevent competition with the mines of Spain and Peru.<sup>80</sup> At various times there were reductions in price, but complaints of the shortage of this necessary commodity continued. This shortage was intensified by the interruptions caused by the American Revolution. Hence in 1777 a long royal order was issued for the regularization of the quicksilver supply of New Spain,<sup>81</sup>

<sup>79</sup> *Monterde's Report*, Sec. 33, *ibid.*, f. 231.

<sup>80</sup> Cf. above, chap. I, p. 12.

<sup>81</sup> *A.G. Reales Cédulas*, vol. 112, No. 135, f. 227.

and in 1779 Bucareli issued an order permitting the exploitation of the domestic quicksilver mines under certain conditions.<sup>82</sup> Under these circumstances the Tribunal actively encouraged the search for and development of quicksilver deposits.<sup>83</sup> Item XVI of the Extraordinary Account is the first of these quicksilver entries. The account referred to, signed by Julián Antonio del Hierro, shows that from June 17, 1780 to March 13, 1781 he received from Lassaga 14,000 pesos for the expenses of these experiments. Of this, \$10,796.07 was spent in the construction of furnaces at Chapultepec, and the experimental smelting of quicksilver therein, together with the necessary materials for the experiments. In addition, the account shows 1561 pesos spent for freight of the ore from the mines to the furnaces and \$446.06 for the printing of six hundred and fifty copies of a Representation in the interests of the mining industry on the subject of alcabalas.<sup>84</sup> The total expense amounted to \$12,807.01, leaving a balance of \$1,192.07, which was returned to the bank.<sup>85</sup> This expenditure would seem to have been an entirely legitimate one, having as its purpose experiments which would have benefited the mining industry. Monterde's criticisms of it were on formal grounds of proper authorization and vouchers.<sup>86</sup> Items XVII to XXIV all cover payments to various individuals for their activities in searching for and examining quicksilver mines, mostly in the neighborhood of Cuernavaca. These were proper expenditures and Monterde's only objections were as to the irregular manner in which they were incurred.<sup>87</sup>

The remaining items concerning quicksilver fall into a somewhat different category. The preceding ones were payments

<sup>82</sup> Beleña, *Recopilación*, vol. L 3a foliage, p. 108.

<sup>83</sup> Cf. chap. v, p. 254.

<sup>84</sup> This Representation re Alcabalas will be discussed in chap. v.

<sup>85</sup> This account, dated April 13, 1782, and signed by del Hierro, is in *A.G. Minería*, vol. 208, ff. 126-128.

<sup>86</sup> *Monterde's Report*, Sec. 35, *A.G. Minería*, vol. 63, f. 233.

<sup>87</sup> *Ibid.*, Secs. 35-40, ff. 233 b-237.

to various persons for exploration and examination, while these following expenses were in the form of *avíos*, or advances, to owners of quicksilver mines for aid in developing and operating them. Like the others, these may well be considered together. The primary purpose of the *Banco de Avíos* was, of course, the financing of mines; but it should be remembered that expenditures for this purpose were considered as loans and were meant to be repaid according to a definite contract entered into at the time the loan was made. From the notes to Items XXVIII and XXIX, it is clear that the expectations of repayment were not fulfilled. Monterde criticized the expenditures strongly, saying that in the archives of the Tribunal there had been found no authorization for financing quicksilver mines nor any resolution as to the terms of such financing or the security for the advances. Hence he recommended that a careful investigation be made as to whether there was just cause for these loans, whether the Tribunal had the faculty to make loans to quicksilver mines, and, if so, whether it could concede them without there first being written agreements as to the provisions which should be taken to safeguard the funds of the bank — “the Tribunal being bound in all cases to exercise the care of a zealous and faithful trustee.”<sup>88</sup> As in the case of some of the other expenses, Julian Antonio del Hierro had some observations on these advances which implied that they were not entirely justified. Thus in regard to the advances to Busturia, as recorded in Item XXIX, he had the following to say:

In this year (1781), after there having been paid to the order of Don Domingo Busturia, three thousand pesos to work quicksilver mines in the region called La Tarjea, the member, Don Ramon de Liceaga, with myself opposing it, proposed that there should be given to the said Busturia, another twelve thousand pesos, and thus it was done notwithstanding my opposition. Said Busturia led the

<sup>88</sup> *Ibid.*, Sec. 41, ff. 237-240; Sec. 42, ff. 240-241.

members astray and the money was sunk in a mine of Real del Monte.<sup>89</sup>

The two payments he referred to make up the 15,000 pesos mentioned in the account; thus, although on the surface these expenses connected with quicksilver would seem to have been proper charges on the Mining Fund, a close examination shows that not only were they incurred irregularly, but that little care was taken to safeguard the advances or use the money to the best advantage.<sup>90</sup>

The final items of this Special Account show that they were even less justifiable as proper expenses. As explained by Monterde the expense listed as Item XXX had its origin in a request by the Viceroy Mayorga that the Tribunal contribute to the support of the new Academy of Fine Arts. The Tribunal agreed to contribute 3000 pesos a year outright and 2000 pesos a year on condition that members of the staff of the Academy should furnish instruction in drawing and architecture to the students of the School of Mines. Monterde expressed the opinion that before making the grant the Tribunal should have called the Viceroy's attention to the many obligations of its funds and also objected to the payment of the 2000 pesos per year before the School of Mines was even established.<sup>91</sup> Del Hierro also had objected strongly to this expense, in language which reflected considerable warmth of feeling and which does credit to his conception of the proper functions of the Tribunal.<sup>92</sup>

The next expense was even less justifiable. The cryptic information given in this account is amplified by del Hierro who

<sup>89</sup> *Del Hierro: Votos Secretos*, No. 10, *A.G. Minería*, vol. 110, f. 377.

<sup>90</sup> As we shall see in chap. v, below, there was some justification for the haste with which these expenses for quicksilver development were undertaken; there was a critical shortage of quicksilver at this time and the Tribunal was being spurred on by the Viceroy to do all it could to develop native sources of supply.

<sup>91</sup> *Monterde's Report*, Sec. 43, *A.G. Minería*, vol. 63, ff. 241-243.

<sup>92</sup> *Del Hierro: Votos Secretos*, Nos. 9 and 11, *A.G. Minería*, vol. 110, ff. 376-377.

tells us that on November 12, 1779 an order was signed for 6000 pesos which the members of the Tribunal wished to present to the Viceroy, Don Martín de Mayorga, and that he (del Hierro) opposed the gift.<sup>93</sup> Monterde could see no just cause for the gift and refused to allow it as a legitimate expense.<sup>94</sup> Similarly the final item of this account of extraordinary expense was disallowed. It appears that this sum was paid to the individual named to reward him for his diligence in trying to persuade the Superior Government to order the repayment of \$500,000 on account of the one million loan of 1782. Monterde, however, refused to accept this as a proper expense; perhaps it would not do for an official of the Royal Treasury to admit that his department needed such prodding to make it pay its obligations.<sup>95</sup>

Returning once more to the General Account, we now come to the item which alone gives us information as to how the Tribunal discharged the primary purpose of the *Banco de Avíos*, the advancing of capital to mines. The entry in the general account simply gives us the total of the amounts still owed to the bank by the various enterprises financed on June 30, 1787. The following list shows how this total was divided among the 21 enterprises aided.

SPECIAL ACCOUNT OF THE ENTERPRISES FINANCED  
AND THE AMOUNTS DUE FROM THEM UP TO JUNE  
30, 1787<sup>96</sup>

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Amounts due from the twenty-one mining enterprises  
which the Real Tribunal de Minería has financed

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1. Don José de la Torre Calderón and Company	\$ 170,655.6.10
2. The Holding Company of the "Mina de Agua" of Temascaltepec	112,736.0. 9
3. The Commissary of War, Don Francisco Roxas Rocha, in the Real de Monte	25,765.3. 0

<sup>93</sup> *Ibid.*, No. 7, f. 375.

<sup>94</sup> *Audit: Credit*, No. 17, *A.G. Minería*, vol. 63, ff. 181-182.

<sup>95</sup> *Ibid.*, No. 18, f. 182.

<sup>96</sup> *A.G. Minería*, vol. 208, f. 162.

4. Captain Don Miguel Pacheco Solis, in the Real del Monte	78,817.0. 0
5. Don Diego José Baquedano, in Quautla	41,945.4.10
6. Don Antonio Villanueva, in Tasco	12,950.2. 8
7. Don Juan Eugenio Santelizes, in the Real de Santa Rosa	48,336.6. 5
8. Don Antonio José Álvarez, in the Real de Atotonilco el Chico	29,971.1. 1
9. Don José Maria Molina, in the Real del Monte	34,267.1. 3
10. Don Pedro Salaverria, in the Real del Monte	10,922.0. 2
11. The Marqués de San Juan de Rayas, in Guanajuato	13,000.0. 0
12. Don Antonio Tenorio and Associates, in Guanajuato	19,087.0. 0
13. Don José Manuel Paniagua in Atotonilco el Chico	13,711.6. 9
14. Don Juan Basco, in the Real de Tetela del Rio	4,947.6. 0
15. Don Indalecio Bernal and Associates, in Atotonilco el Chico	6,600.0. 0
16. Don Cayetano Arechavala Cia., in Tlalpujagua	10,265.7. 0
17. Don Manuel Martínez Viedma, in Tasco	9,923.5. 8
18. Don Sylvestre López Portillo, in Real de 14	25,375.0. 0
19. Don Francisco Antonio Arenas in the Real de Albadeliste	23,622.0. 0
20. Don Francisco Rodriguez Bazo, in the Real del Monte	6,142.3. 5
21. Don Agustín Goycoechea in the Real de San José del Oro, Jurisdiction of Zimapán	1,501.5.0
Total	\$ 700,545.3. 7
To this total there should be added 1800 pesos which was paid to Don José Manuel Balcarcel for visiting ten of these enterprises as explained in the records	1,800.0. 0
	\$ 702,345.3. 7

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Mexico, 30th June, 1787

[Signed] Manuel Prieto y García

While this list gives us very little information as to the amounts advanced to or received from these various individuals, it does indicate that none of them, up to the time the account was formed, had been able to repay all the money advanced. Thus, from this point of view, the venture had not been a success, and the bank had been forced to bear an exceedingly heavy loss. To see the whole picture, however, we





must go into the individual accounts which made up this total. The accompanying photostat gives some further information — showing the totals loaned each enterprise, the amount collected from it, and the balance due. This summary is followed in the files by a separate account for each of the enterprises, showing the amounts debited to it as advanced by the bank and credited because of silver produced and deposited with the bank. For example, the account of the bank with Don José de la Torre Calderón and his associates shows that the financing began in the middle of the year 1784 and was still continuing when the account was closed on June 30, 1787. Payments in varying amounts were made to the agents of the owners once or twice a month and charged against the enterprise. Unfortunately the account does not show how the money was spent, and no other record of this has been found. As we shall see below, Monterde objected to this omission and we can only speculate on the question. Presumably it went for labor and supplies, but as to the relative proportion of each we have no indication. This mine began to produce returns within a relatively short time after the financing began, and thereafter sent in silver regularly to be credited to its account with the bank. Although the silver sent in was never sufficient to balance the capital advanced, this mine's record in this regard is far better than most of the enterprises. Up to June 30, 1787, Calderón and Company had received \$472,272. 2. 1, and had been credited with \$301,616. 3. 3. In other words, about 64.70 per cent of the capital advanced had been paid back. This compares favorably with the 42 per cent which was the percentage of the total capital advanced to all the enterprises repaid by them. The summaries of the sums advanced to and received from the other enterprises financed are shown in the accompanying table.

One feature of these records also shown in the table is the premium which the bank received on the silver turned in by the various enterprises. It will be remembered from the

Ordinances that following the practice of the old *Bancos de Plata* the *Banco de Avíos* was to receive a premium on all silver collected; that is, the amount credited to any given enterprise on a delivery of silver was less than what the bank actually collected at the Mint. The amount of the premium was one of the things to be specified in the preliminary contract with the bank, presumably varying with the risk involved in each case. The figures in the table show that the premiums collected by the bank varied between 2.2 per cent and 14.8 per cent of the sums credited to the various enterprises, with the average as figured from the totals being 5.9 per cent. If it be assumed that the total silver brought in was equal to that credited to the various enterprises plus the total premium, then the average premium works out as almost exactly 5 per cent on the silver brought in. Considering the risk involved in financing mines, this must be looked upon as a very modest discount.

It is also important to note the dates when this financing occurred. No loans were made by the bank before July 1784, and in the case of all the 21 enterprises the financing had begun by July 1785. In some cases it had continued for only a short time, while a number of enterprises were still being financed when the account was closed. Hence all transactions recorded in these accounts took place between July 1784 and June 30, 1787.<sup>97</sup>

<sup>97</sup> The dates between which the financing of each of the twenty-one enterprises took place are as follows:

- No. 1 July 1784-June 1787
- No. 2 July 1784-June 1787
- No. 3 September 1784-October 1785 (?)
- No. 4 March (?)—June 1787
- No. 5 October 1784-May 1787
- No. 6 November 1784-April 1786
- No. 7 October 1784-June 1785
- No. 8 November 1784-March 1787
- No. 9 November 1784-April 1786 (?)
- No. 10 December 1784-September 1785
- No. 11 January-October, 1785

Having before us the facts relative to the financing of mines by the bank insofar as they are available, we may now attempt to form some conclusions, with the help of Monterde and del Hierro. The question we must answer as best we can is: to what extent did the Tribunal, through the *Banco de Avíos*, fulfill the primary object of its creation, namely, the supplying of capital to worthy mines and thus increasing the production of silver in Mexico? The first fact that strikes us is that the Tribunal waited seven years after its organization before taking up this task. In the earlier chapters we saw that all authorities agreed that what the mining industry needed most to bring it out of the doldrums was an adequate supply of capital; and among those who stressed this point most strongly were Lassaga and Velásquez de León in their Representation of 1774. Yet, once these individuals were in a position to carry out their recommendations, they delayed until 1784.<sup>98</sup> Why this delay? Elhuyar, writing in 1813, stated that no financing had been done prior to 1784 because the Tribunal was awaiting the promulgation of the Ordinances.<sup>99</sup> He was in a position to know and in the absence of any other explanation his statement must be accepted. It is not clear, however, why the Tribunal awaited the formation of the Ordinances to exercise this

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No. 12 February-August, 1785

No. 13 February 1785-January 1787

No. 14 January-October 1785

No. 15 January-June 1785

No. 16 February 1785-February 1787

No. 17 February 1785-February 1786

No. 18 February 1785-March 1786

No. 19 March 1785-June 1787

No. 20 May 1785-February 1786

No. 21 June 1785 only

The numbers above correspond to the numbers in the account at p. 128 and in the photographic reproduction. The dates are taken from the individual accounts of each of the enterprises with the Bank, referred to above. These are found in *A.G. Minería*, vol. 208, ff. 164-207.

<sup>98</sup> *A.G. Minería*, vol. 48, exp. No. 6, Doc. No. 30, f. 154.

<sup>99</sup> Fausto de Elhuyar, *Reflexiones sobre la Constitución actual del Cuerpo de la Minería de Nueva España* (1813), *A.I., Sec. 5, Aud. de Méx., Leg.* 2250.

function, which had been considered as the most important object of its creation. The only apparent limitation put on its activities by the crown prior to 1784 was the exercise of contentious jurisdiction; and it certainly showed no hesitation in spending money for other purposes. It is more than probable that whatever reason the Tribunal had for awaiting the Ordinances was given practical weight by the fact that it lacked adequate funds to begin financing on any considerable scale. Instead of using borrowed capital for this purpose, reliance had to be placed on surplus income, in part at least, because the capital which was raised was diverted to other purposes; and, given the reckless manner in which the finances were administered, the surplus did not grow very rapidly. The fact that the first *Junta General* was held in July 1784 may also have had something to do with the beginning of financing at that time, particularly since some of the delegates to that junta were among the first miners to receive *avíos*.<sup>100</sup>

Having seen that, whatever the reason, the financing was not begun before 1784, we may now seek to answer two further questions. Once it had actually started, was this financing of mines wisely handled, and were the benefits accruing from it to the mining industry and the country as a whole commensurate with the expectations held out in 1774? In regard to the administration of the *avíos*, we have a certain amount of contemporary evidence. The Ordinances prescribed in detail the procedure to be followed in advancing capital to mines. This involved a careful investigation of the mine by a qualified engineer, a considered judgment of the risk involved and the probable benefits to be derived, and a carefully drawn contract between the bank and the miner specifying the terms of the financing, the security, and the premium to which the bank

<sup>100</sup> This *Junta General* is reported in the *Gaceta de México*, vol. 1, No. 15, July 28, 1784. The persons later financed who were delegates to this *Junta* were those mentioned in enterprises Nos. 3, 4, 5, 7, 9 of the list at p. 128. As shown below del Hierro opposed four of these five enterprises as unsound.

should be entitled. How far this procedure was carried out in practice is uncertain; at least the evidence was not presented to Monterde. If they ever existed, the Tribunal's records of these grants are missing. The deputy Julián del Hierro, however, kept a record of some of the grants to which he had been opposed and this will shed some light on the subject. This record shows that he opposed, in whole or in part, the enterprises numbered 3, 4, 7 to 11 inclusive, and 19.

In regard to the third enterprise financed, del Hierro records that on August 21, 1784 Lassaga and Liceaga decided to aid Don Francisco Roxas Rocha, and that he, del Hierro, voted against the loan. He did this because the man commissioned to investigate the mine reported that it would be necessary to enlarge the shaft from its mouth, because no pipe would fit in; because he found solid rock walls and no levels; because samples of the ore showed a very low assay; and, finally, because Roxas Rocha had no experience in mining, this being his first mine, which he had bought for 200 pesos. For these reasons del Hierro opposed both the grant of money and the promise of supplies.<sup>101</sup> Nevertheless, the grant was made and the first payment recorded as of September 4th.<sup>102</sup> It is worthy of note that this grant was made by the affirmative vote of only two of the five members of the Tribunal and that up to June 30, 1787, there had been repaid only 6.65 per cent of the money advanced by the bank.

The next financing which this same deputy opposed was that granted to Don Miguel Pacheco Solís. From several points of view this was a complicated and irregular grant. The record of the financing of this enterprise shows that the first payment of 10,000 pesos was made on May 12, 1784, under an order of Lassaga and Velásquez de León only. This entry then says that this payment was made in the time of the first factor

<sup>101</sup> *Del Hierro: Votos Secretos*, No. 14, A.G. *Minería*, vol. 110, f. 377.

<sup>102</sup> *Cuenta particular de las negociaciones avilidas*, A.G. *Minería*, vol. 208, f. 177.

(Aniceto del Barrio), for which reason it was not charged to the Tribunal in its account. Besides the other later payments which were made in fairly regular form, there is another of 10,000 pesos entered in this account as having been paid to Pacheco Solis by Don Aniceto del Barrio on the 15th of March 1783; it is said this sum was recorded by Don Aniceto in the settlement of his account.<sup>103</sup> Hence it appears that there were two payments of 10,000 pesos each made irregularly before the Tribunal actually voted to finance Pacheco Solis.

This question came before the Tribunal on the first of October 1784, when Lassaga and Liceaga decided to finance this individual and made an initial grant of 4000 pesos. Again del Hierro voted against the proposition, alleging that the shaft and development work, for which he wished the money, were very extensive and costly, and that the grant would be contrary to Article 15, Tit. 10, of the Ordinances, which required necessity and the promptness with which a return might be expected to be criteria in making these grants; furthermore, he said, there had been no examination of the work projected or the mines denounced, nor any estimate of the probable benefits to be derived from such financing.<sup>104</sup> He also recorded that when the question of another payment to Pacheco came up on December 17th, he again opposed it for the same reasons. He said Liceaga was absent and that the grant was approved by Lassaga and Velásquez.<sup>105</sup> Again his judgment seems to have been sound, as up to June 30, 1787 Pacheco Solis had received \$78,817, and paid back not one real. When the account was presented to Monterde, he threw out entirely the 20,000 pesos paid irregularly before October 1, 1784, charging that this really had been advanced by the factor privately and should be added to the amount of the latter's indebtedness to the bank.<sup>106</sup>

<sup>103</sup> *Ibid.*, f. 178.

<sup>104</sup> *Del Hierro: Votos Secretos*, No. 15, A.G. *Minería*, vol. 110, f. 378.

<sup>105</sup> *Ibid.*, No. 21, f. 381.

<sup>106</sup> *Audit: Credit*, No. 19, A.G. *Minería*, vol. 63, ff. 182-184.

We have no specific information in regard to the enterprises Nos. 5 and 6 — the grants to Baquedano and Villanueva. Del Hierro apparently did not object to these grants, or else was absent when they were made; and in this connection it is of interest to note that these two enterprises repaid respectively 60.9 per cent and 74.5 per cent of the sums advanced them, as opposed to returns of 6.65 per cent and 0 per cent in the preceding cases where del Hierro opposed the grant.<sup>107</sup>

The next enterprise (No. 7) involved the financing of the mines of Don Juan Eugenio Santelices. This was another venture opposed by del Hierro. He recorded that on October 29, 1784, Lassaga and Liceaga signed a decree authorizing a contract for avíos to be entered into by the bank with Santelices and that the latter together with the clerk of the Tribunal brought it to his house for his signature in accordance with the Ordinances. He said he opposed the grant because (1) Santelices had spent on these mines over 200,000 pesos loaned him by other parties without results; (2) the title of one of the mines was not good; (3) the agreement of the prior creditors to the pledging of certain smelters as security for the avíos had not been obtained; and (4) that no examination had been made to determine the actual condition of the mines.<sup>108</sup> The financing apparently had no better results than del Hierro had foreseen and was discontinued in June of 1785, after over \$50,000 had been paid out.<sup>109</sup> This did not end the importunities of Santelices nor the complacency of the other members of the Tribunal. On September 5th, he was authorized by Liceaga and Portillo to seek to borrow money at interest (for which the Tribunal presumably would be responsible) to continue the avíos which had been advanced him by the bank. In other words, the Tribunal said, in effect, "We are sorry but we haven't any more money of our own, but if you can find someone

<sup>107</sup> *Cuenta particular de las negociaciones avilitadas*, A.G. Minería, vol. 208, ff. 180-186.

<sup>108</sup> *Del Hierro: Votos Secretos*, No. 16, A.G. Minería, vol. 110, f. 379.

<sup>109</sup> *Cuenta particular . . . A.G. Minería*, vol. 208, ff. 187-188.



who will loan it, we will go ahead with you." Del Hierro opposed this in vain, as he did the permission granted a month later by Velásquez, Liceaga, and Portillo for Santelices to seek an outside *aviador*.<sup>110</sup> In this enterprise as in the others, del Hierro's judgment was shown to have been sound, as up to June 30, 1787 Santelices had only repaid 11.2 per cent of the money advanced him.

The financing of Don Antonio José Álvarez seems not to have been opposed in itself by del Hierro, but he did object to the payment of large sums in single installments. On November 6, 1784, the Tribunal authorized the payment of 16,000 pesos<sup>111</sup> to Álvarez, and del Hierro recorded that he urged Lassaga and Velásquez to make the payments in smaller amounts. He gave as his reason that in other similar cases the beneficiaries had used the money thus obtained to pay up back debts and for other purposes contrary to the Ordinances and foreign to the purposes for which the money was loaned.<sup>112</sup> In this case, however, del Hierro's fears may have been exaggerated, as Álvarez's record was considerably better than the average, showing a return of 45.3 per cent of the money advanced.

Del Hierro also opposed the grant of avíos (No. 9) which was made to Don José María Molina in November 1784. He explained his opposition by saying that no examination had been made of one of the mines, "El Chagre," which he alleged had been denounced solely to give Molina a pretext for applying for a loan, and because he presented no valid title to the other mine, "San Juan del Alto."<sup>113</sup> In spite of these excellent reasons for refusing it, the request for funds was granted and in the course of the next eighteen months \$44,246 was advanced Molina, of which the bank recovered \$9979 or 22.6 per cent.<sup>114</sup>

<sup>110</sup> *Del Hierro: Votos Secretos*, Nos. 31 and 30, *A.G. Minería*, vol. 110, f. 381.

<sup>111</sup> *Cuenta particular . . . A.G. Minería*, vol. 208, f. 189.

<sup>112</sup> *Del Hierro: Votos Secretos*, No. 18, *A.G. Minería*, vol. 110, f. 381.

<sup>113</sup> *Ibid.*, No. 19, f. 382.

<sup>114</sup> *Cuenta particular . . . A.G. Minería*, vol. 208, ff. 191-192.

Similar objections were raised by del Hierro to the financing of Don Pedro Salaverría, whose request for funds came before the Tribunal on the same day as that of Molina. He alleged that Salaberria had a most imperfect title to the mine in Real del Monte which he wished to develop, that this had been called to his attention previously with orders to produce new evidence. This he failed to do, but Lassaga and Liceaga voted, nevertheless, to grant the request for avíos.<sup>115</sup> This financing did not extend over a very long period, lasting only until September 1785; but during this time \$11,079 was advanced, of which up to June 30, 1787 only 157 pesos or 1.406 per cent had been repaid.<sup>116</sup>

The financing of the eleventh enterprise — that of the Marqués de Rayas and his associates for developing two mines in Guanajuato — also extended over a brief period — from January to October 1785. During this time 21,000 pesos were advanced and 8000 recovered, a return of 38 per cent, only a little short of the average.<sup>117</sup> Nevertheless, del Hierro had opposed this grant when it came before the Tribunal on the 10th of December for reasons similar to those in the preceding cases. He implied that the request was granted largely because the deputy Liceaga was one of those interested in the mine.<sup>118</sup>

Unfortunately we have not the benefit of del Hierro's interesting comments on the remaining enterprises which make up the list of persons financed by the Tribunal. He mentioned in his record that he was absent on vacation from the 11th of January to the 23d of June 1785.<sup>119</sup> It was during this period that the financing of all the remaining enterprises was begun. Of these there are no records except the actual accounts of payments and receipts, which make, on the whole,

<sup>115</sup> *Del Hierro: Votos Secretos*, No. 22, *A.G. Minería*, vol. 110, f. 383.

<sup>116</sup> *Cuenta particular . . . A.G. Minería*, vol. 208, f. 193.

<sup>117</sup> *Ibid.*, f. 194.

<sup>118</sup> *Del Hierro: Votos Secretos*, No. 20, *A.G. Minería*, vol. 110, f. 379.

<sup>119</sup> *Ibid.*, No. 23, f. 381.

a pretty dismal showing.<sup>120</sup> We do not know, of course, what del Hierro's opinion would have been on these enterprises, but there is no reason to believe that in his absence the other members of the Tribunal exercised more care than they did when approving some of the earlier grants over his active opposition. There is even a hint that some of the grants made during his absence were ones which he had been successful in preventing earlier. He recorded that on December 5, 1787 he signed after Lassaga and Velásquez, in accordance with the Ordinance, the contract for avíos with Don Francisco Arenas (No. 19) which had been approved in March during his absence, and noted that he had opposed this request when it had been presented to the Tribunal the year before.<sup>121</sup>

Having seen something of the procedure followed in the financing of the mines, we may hazard an answer to our question as to whether it was wisely handled. The evidence presented seems to indicate conclusively that it was grossly mismanaged. It must be noted, however, that thus far we have been forced to view this question largely through the eyes of del Hierro, who was obviously at odds with the other members of the Tribunal. Hence we must be on our guard lest his personal opinion be accepted too hastily as a dispassionate judgment. On the other hand, it is impossible not to give considerable weight to his views. Judging it solely by the success of the mines financed in repaying the money advanced, the Tribunal's judgment seems to have been far from wise, and del Hierro's comments give us specific examples of what was clearly imprudent practice. In this connection, it is interesting to note that the enterprises which were approved while del Hierro was present, and to which he had made no objection, paid back to the bank an average of 52.36 per cent of the money advanced to them; while those projects which were approved over his opposition or in his absence showed an

<sup>120</sup> *Cuenta particular . . . A.G. Minería*, vol. 208, ff. 195-207.

<sup>121</sup> *Del Hierro: Votos Secretos*: No. 24, *A.G. Minería*, vol. 110, ff. 384.

average return of only 14.25 per cent. Only one of the enterprises of which del Hierro approved, at least tacitly, repaid less than 60 per cent of the advances; that one proved to be a bad risk and returned only 12.4 per cent. On the other hand, of those authorized over his opposition or in his absence, only one paid back more than 50 per cent and eight returned less than 2 per cent.<sup>122</sup> Hence, from the actual results shown by the various enterprises, we would seem to be justified in giving considerable weight to del Hierro's opinions and criticisms. It may be suggested that his comments were based on wisdom acquired subsequent to the authorization of the various grants and were inspired by a desire to clear himself of responsibility. From the introduction to his secret record, it is apparent that his purpose was to clear himself of responsibility, but the fact that he died before Monterde made his charges, and that he stated that his record was a current one and not retrospective, would indicate that his desire to clear himself came from his own realization of the irregularity of many of the Tribunal's acts rather than from the subsequent disclosures of Monterde.

It is most unfortunate that we have not the documents which show what the factors were which persuaded the Tribunal to undertake the financing of these various enterprises. Del Hierro alleged that there was a disregard of the Ordinances and lack of care which foredoomed many of the ventures to failure. As we shall see, Monterde reached much the same conclusion. Before turning to his judgment, however, we should examine what little evidence we have from the Tribunal itself bearing on this subject. This is in the form of a report prepared by the Tribunal at the order of the Viceroy, and sent to him on June 2, 1786. It was signed by del Hierro (at that time Administrator General), Liceaga, and the Marqués del Apartado, and entitled "A Report of the Tribunal de Minería to the Viceroy on the present state of the Mines financed by it, showing those which should continue to be

<sup>122</sup> These percentages are based on the figures in the summary at p. 130.

aided, those which should not, and the motives for having suspended the financing of some.”<sup>123</sup> This document was a combined attempt at justification and explanation of why the ventures had not turned out as had been hoped, together with recommendations for the future. It began by saying that the financing of all these mines was preceded by all the examinations and other precautions required by the Ordinances — referring to the record of these in the archives of the Tribunal. (It did not show to what extent the results of these investigations were kept in mind when making the grants.) The report then continued as follows: “and although some of them have not worked out according to the good possibilities with which they appeared to be endowed and of which the commissioners gave information, we have hopes that most of the enterprises will return to the *Banco de Avíos* the sums which have been advanced to them, with a continuation of the aid which their operations require.” The deputies said that in every case it had been claimed by the individuals financed that less capital than was actually advanced them would serve to put the mine on a productive basis, and that this general excess of requirements over estimated needs led to the gradual exhaustion of the funds available for this purpose. In justification of this result — which obviously should have been foreseen by men of any experience with mining — they pointed out that mining was always uncertain and that unforeseen difficulties involved new operations and expenses. The exhaustion of the funds did not lessen the demands for capital to make productive the mines where work had already made considerable progress. To meet this situation, the Tribunal reported that in May 1785 it had sought from the Central Government a loan at interest from the Fund of the Temporalidades, but that this was not forthcoming and that some small amounts which were raised were not sufficient.<sup>124</sup> This situation had made it necessary to sus-

<sup>123</sup> *A.G. Minería*, vol. 63, ff. 8-14.

<sup>124</sup> These were undoubtedly Items 4, 5, 6 of the *General Accounts-Receipts*.

pend the financing of the various mines until sufficient capital should have been accumulated to continue those which recent investigations showed to be worth while.<sup>125</sup> The temporary exhaustion of funds was given as the principal reason why many of the mines financed had suspended operations and others were merely working to the extent allowed by their own production.

Another excuse given, both for the inactivity of many mines and their backwardness in returning the capital advanced them, was the drought which beset the country at that time. Beginning about 1785 the country suffered several years of severe drought, the effects of which were intensified by plague. The report said that from these causes many laborers died or abandoned the mining centers. Not only did the lack of food cause a great shortage of labor, but it also led to a scarcity of animals necessary to work the pumps and hoists of the mines and mills of the smelters.<sup>126</sup> To this cause was attributed the fact that the mines of Temascaltepec financed by the Tribunal (Enterprise No. 2) were not producing ore, although the funds advanced had enabled all the preliminary work of drainage and development to be completed and there was evidence of rich deposits. For the same reason, thirteen pumps in Pachuca had been forced to cease working; these had allowed the extraction of abundant ore and the tapping of new veins, but since they had been forced to shut down, only a small quantity of metal was being mined from the upper levels at high costs. Similar conditions existed in a number of the mines of Quautla, Taxco, Real del Monte, and El Chico. All of these mines, it was reported, produced little ore, just about enough to keep going without further aid from the bank.

<sup>125</sup> Another reason, and a more potent one, why the financing was discontinued, was that a royal order of May 27, 1786 ordered the immediate suspension of this activity. *Reales Cédulas*, vol. 134, No. 53, cf. below, p. 163.

<sup>126</sup> The effects of these natural calamities on the mining industry are substantiated by two articles in the *Gaceta de México*, vol. II, No. 23, Dec. 5, 1786; and vol. IV, No. 25, Jan. 11, 1791; cf., also, H. H. Bancroft, *History of Mexico*, four vols. (San Francisco, 1883), III, 395.

In a different class were the mines of the Marqués de Rayas and Don Antonio Tenorio in Guanajuato, those of Don Miguel Pacheco Solís in Real del Monte, those of Don Agustín de Goicoechea in Real del Oro, and those of Don Cagetano Arechevala in Tlapujagua (Enterprise Nos. 11, 12, 4, 21, and 16). These, together with one of the mines in Taxco and one in Atotonilco el Chico, were still in the course of development and were not producing any ore; hence, work in them had been suspended because of the cessation of financing by the bank and the unfavorable weather.

Finally, the report set up a third category as follows:

The mines of Don Francisco Roxas, those of Don Indalecio Bernal, of Don Pedro Salaberria, of Don Juan Basco, and of Don Francisco Arenas, not only have not returned to the Bank their debts, but according to the information which this Tribunal has received of their present state, they hold little hope of producing profitable ore, because of which it has been judged best to abandon them, salvaging what equipment there may be.<sup>127</sup>

These are the only particulars given relative to the various mines financed. The general conclusions and recommendations of the Tribunal were summed up as follows:

. . . The above, Your Excellency, is the condition in which are found the twenty-three enterprises which the Tribunal showed Your Excellency to have financed with the funds of its bank; in them there are invested the \$641,152.0.0. of the deficit which appears; but we only doubt the total return of the sums owed on the part of the five mines last named in which there are invested 72,235 pesos including the allowance for maintenance; because all the rest (with the exception of those which are in course of development and which we still hope and wait for) have shown their ores and have sent silver to the office of the Tribunal, and . . . we hope that the *avíos* can be continued; and also for those which are in the course of development because of the good reputation which they have for having produced profitable ore in former times. In order to assure

<sup>127</sup> It is interesting to note that none of these projects was approved by del Hierro.

itself and to proceed with more knowledge and information in the future, this Tribunal determined to send an expert inspector of practical experience to examine the mines financed, their mills, and surroundings, and to this effect, there have been examined those in the Province of Pachuca and this is being considered in the revision of the accounts.

Two discrepancies will be noted between the figures mentioned here and the ones from the account we have been considering. In the first place, 23 enterprises are spoken of instead of the 21 we have been discussing. The only possible explanation of this — aside from a clerical error — is that between June 1786 and June 1787 two of the enterprises liquidated their accounts with the bank and hence did not appear in the list of "accounts receivable." The other discrepancy is between the \$641,152 cited here as due and the \$700,545 of June 30, 1787. Here the explanation is probably twofold: first, that some additional sums were advanced during the year following this report; and, second, that the above amount does not include sums paid to various miners as subsistence allowance. The next paragraph shows that these payments reached a total of approximately \$50,135 divided among 13 of the enterprises. It is probable that these amounts were included in the final statement of indebtedness. This report closed with the statement that every precaution, consistent with the inherently speculative nature of mining, was taken to safeguard the funds advanced. The failure of the enterprises to return a larger part of the capital advanced was attributed (1) to the lack of sufficient capital to carry some of the mines to the point where they would show profitable returns, and (2) the natural calamities which had rendered the actual working of the mines difficult and in some cases impossible.

Such then was the Tribunal's "apologia." While not offering a completely credible justification, it does present some reasonable explanations for the backwardness of the miners in repaying the advances. The natural calamities undoubtedly played



a part in retarding the productive activity of many mines. Furthermore, it is quite probable that the exhaustion of the capital available prevented some mines shifting from the development stage to active production; in all mines a certain amount of development work is necessary and if it cannot be carried through to completion the whole investment is likely to be lost. Hence, there was reason in their argument that if further money could be loaned to those mines still in process of development, they might become profitable and the entire amount advanced might be salvaged.

After making all the allowances possible, the Tribunal still must be charged with carelessness and negligence in these matters. We have seen no evidence of careful investigation or the following of expert advice in making the various grants. Even if we admit that further development might make some of the enterprises profitable, the fact remains that the Ordinances had not intended the financing of ventures which would involve such long commitments. The fund was supposed to be a revolving one, in order that as many mines as possible might be aided, and this naturally meant the relatively prompt repayment of capital advanced. If this was the intention when it had been expected to have available a fund of \$2,000,000, it should have kept in mind even more when there were resources of but a few hundred thousand pesos. Before leaving this report one other point should be commented on. This involves the persons who signed the report. What is the significance of the fact that del Hierro was one of the signers? After his criticism of many of the loans, it is surprising to find him signing this report which on the whole tends to put them in a favorable light. While we do not know his exact motives, it is more than probable that he did this simply in accordance with the Ordinance which provided that all decrees should be signed by the Administrator and two Deputies even though one of these three did not agree with the vote of the other two.<sup>128</sup>

<sup>128</sup> *Ordenanzas*, Tit. III, Art. 8.

Or it may be that having become Administrator, he considered it his duty to view the situation realistically as it was and not as he might have wished it, and that the views presented here represented his opinion as to the best means of salvaging the capital already invested. The report, of course, was not signed by Lassaga or Velásquez de León, both of these men having died some months previously. Hence Liceaga was the only other signer who had taken a positive part in making the loans. In some ways this detracts from the significance of the document, but, on the other hand, it is noteworthy that members of the Tribunal, as here constituted, sought to defend the loans made by their predecessors and appeared to believe that most of the capital advanced could be salvaged.

Monterde's comments on this subject are of particular value because he had before him not only the above material but additional evidence now lost. We have already seen that of this item (77) the auditor disallowed entirely 20,000 pesos of the money advanced to Pacheco Solís, claiming that this was paid irregularly by the factor, Don Aniceto del Barrio, and was due the bank from his estate. This was the only item actually disallowed, but it is clear from the general criticism that this was only because he did not possess sufficient data to pass final judgment on all the other payments. Monterde's criticisms of the manner in which the Tribunal handled this financing of mines are so pungent that they are given here:

It has already been said in paragraph nineteen of the audit of the amounts credited to the funds of the Bank that there has been charged in one single entry in the General Account (Item 77) \$702,345. 3. 7, due from the twenty-one enterprises financed by the Tribunal and subtracting from this total sum the twenty thousand pesos which clearly were to be erased immediately for the reasons explained in the said audit, the item stands at the sum of \$682,345. 3. 7, on which there are many important points to make observation: *first*, that although there have been presented the particular accounts which have been carried by the office of the Factor for each one of the said twenty-one enterprises, none of the authen-

ticating documents has been produced; *second*, that after examining carefully the entries in each one of the said accounts, it was found that they were kept without the proper order, care, or clear method which is necessary in every administration of property . . .; *third*, that most of the payments appear to have been made to the persons financed alone and not with the agreement of the interventors, as they should be, alike for the greater security of the funds of the Bank as in order that at any time responsibility might be placed on these for the legitimate expenditure of that paid; *fourth*, that for this same purpose, there should be expressed, as there is not, at the beginning of each account, the interventor named for the enterprise in question, the day on which *avíos* had been conceded it by the Tribunal, and the premium on the silver agreed upon; *fifth*, that in the said total sum of money due, there are included considerable sums given to the enterprises financed in consequence of the agreements made with the Tribunal with the title of food stuffs (*alimentos*), without there appearing any just cause for such a burden being permitted on the funds of the Bank, . . .; *sixth*, that there are also included in the total of this sum, some items given for the payment of debts of various of those financed, without there appearing any just reason which the Tribunal could have for agreeing to this, with grave prejudice to the funds of the Bank; *seventh*, that the proper and necessary measures do not appear to have been taken to recover the sums due from the enterprises at the time when the *avíos* to them were suspended; *eighth*, that neither does it appear that the balances which these enterprises had at this time were recovered; *nine*, that it is not known whether the accounts have been demanded and examined with the proper care by the administrators and interventors, which each one of the enterprises should have given them; *tenth*, that neither is it known nor is there any evidence, if in general, the Tribunal visited and inspected the good administration, the organization of the work and the proper extraction of the metals; *eleventh*, that examination should be made as to whether in the case of all the enterprises to which *avíos* were granted, there preceded all the proper measures and examinations required by the Royal Ordinances, on which subject there should be noted very carefully, the notes which the Deputy General, Don Julián Antonio del Hierro, made in his note book, at Nos. 14-32. The importance of all the above reflections is apparent, it being clear that from them, it should be possible to reckon considerable sums in favor of the funds of the Bank against the Ministers who have composed the Tribunal, and it is clear that

the whole matter demands many long and careful investigations; but, as for this there are now being drawn up, twenty-one separate files in which each one of the enterprises financed is treated in detail, and in which the Auditor has already noted in detail that which he has found worthy of remark, their final settlement should be delayed; and thus this present note has only been dictated to give in this judgment a general idea of the serious objections which in justice arise from the entry in question; it being impossible to overlook that in this there are included 1,800 pesos given to the engineer, Don José Manuel Valcarsel, for the visit which he is said to have made to ten of the said enterprises, without any one of those having been charged its proportionate share of this expense; as there is no record of the time which the said commissioner spent in each case.<sup>129</sup>

This exhaustive criticism leaves little to be said concerning the administration of *avíos* by the *Tribunal de Minería*. It is clear that these matters were handled no more carefully than were the other financial aspects of the Tribunal, and Monterde's judgment only serves to confirm the impression given by the evidence available today and which has been presented in the preceding pages.

In the beginning of this discussion of *avíos* we set ourselves two questions to answer: first, was the financing of mines wisely handled? And, second, were the benefits accruing from it to the mining industry and the country as a whole commensurate with the expectations held out in 1774? The first has been answered in the negative; it seems impossible to avoid a similar reply to the second. We have seen that a total of \$1,209.903 was advanced to the various enterprises. There was received by the bank as repayment 509,397 pesos' worth of silver produced by the mines aided. Inasmuch as no single mine had paid back 100 per cent of the money advanced it, and as the Ordinances and contracts for *avíos* provided that all silver produced should be turned into the bank, we may assume that this \$500,000 represents the total production of the mines aided for these years. Without the aid from the bank, it is

<sup>129</sup> *Monterde's Report*, Sec. 44, *A.G. Minería*, vol. 63, ff. 243-247.

fair to assume that these mines would not have been worked and this silver would not have been produced. In other words, we may credit the Tribunal and the bank with having made possible the production of \$500,000 worth of silver in the years between 1784 and 1786, which otherwise would not have been produced. This is a respectable sum of money, but when we turn to the coinage figures showing the total silver produced in the country, this amount is shown to be relatively insignificant. During the two years 1785-86, a total of \$34,871,570 of silver was coined in Mexico. The sum of \$500,000 representing the production of the mines financed by the bank for these same years thus represents only 1.43 per cent of the total production of the country for these two years.<sup>130</sup> Furthermore, the total production for these two years was actually some \$9,000,000 less than for the two preceding years (1783-84). This was due in part to the natural calamities referred to above and partly to the inevitable variation from year to year. But we are forced to conclude that the efforts of the bank to aid mines had very little immediate effect on the production of silver in Mexico. Of course, we have seen from the Tribunal's report above that a considerable part of the capital advanced went for development work in the mines which had not yet reached the productive stage. Insofar as these efforts led to future production, they were beneficial and served to fulfill the purpose of the bank just as fully as the silver actually produced.

But when one compares the actual results with the hopes held out in 1774, the failure of this important phase of the Tribunal's activity to materialize as expected is all too obvious. It will be remembered that when urging the abolition of the double seigniorage, Lassaga and León had forecast that the taxes on the increased silver production resulting from the

<sup>130</sup> Actually some of the silver included in the production of the mines aided by the Bank did not come in until 1787; allowance for this would only serve to reduce the percentage still lower.

capital furnished by the bank would more than offset the loss which the crown would suffer by giving up this double seigniorage. If we accept the figure of \$150,000-\$200,000 as the amount which the crown lost annually by turning this impost over to the *Tribunal de Minería*, it will be seen that it was necessary for the production to increase by \$1,500,000 to \$2,000,000 per year in order that the income from the *diezmo* might compensate for this other loss. It is true that in the years following 1774 the annual production did average \$2,000,000 more than previously, but before 1785 none of this increase could be credited directly to the bank, and we have seen above that once the mines aided by the bank did begin production they only produced about half a million pesos' worth of silver in two years. In other words we may say that from 1777 to 1787 the crown lost \$1,520,267. 3.10<sup>181</sup> in seigniorage and received about \$50,000 as the *diezmo* on the silver for whose production the bank was responsible.

In all the discussions leading up to the formation of the *Tribunal de Minería* it was claimed that the principal need of the mining industry was capital and that this could only be furnished through some such powerful organization as the Tribunal. The total gold and silver production from 1777 to 1786 average 4.86 million pesos per year more than the annual average for the ten preceding years. Yet up to 1784 the Tribunal had furnished not one real of capital to mines, and in the two years when it was responsible for some parts of the total production the latter was actually several millions less than in the preceding two years.

From all this the conclusion seems forced on us that the *Banco de Avíos* played very little part in fomenting the production of gold and silver in Mexico up to 1787.<sup>182</sup> A number

<sup>181</sup> This is the income of the Tribunal from Jan. 1777 to Dec. 1786 (cf. *General Accounts: Receipts*, Item 1). Under the old order this and some additional would have gone to the crown.

<sup>182</sup> As we shall see in the last chapter, no mines were financed by the *Banco de Avíos* after 1787.

of explanations for this failure to come up to expectations present themselves. First, and probably most important, was the failure of the Tribunal ever to raise the capital of \$2,000,000-\$3,000,000 which had been intended to be available for this purpose.<sup>133</sup> This not only delayed the beginning of the financing, but by making the bank dependent on income for its capital loans greatly restricted the scope of its activities and usefulness. Then, too, a considerable share of the responsibility for the failure of this objective must be charged to the incompetence of the persons handling it. This factor operated directly through the bad choice of the various enterprises and indirectly through the waste of the funds of the Tribunal on extraneous matters. When we remember the manner in which the funds of the bank were spent, it is remarkable that as much as \$1,200,000 was found with which to finance mines. A final explanation for the failure of the financing of mines to come up to expectations is undoubtedly the fact that these expectations were too high. In the various representations which preceded the formation of the Tribunal, it had been stated repeatedly that only the lack of capital kept the mining industry from flourishing and that if this capital were supplied, the production would increase by leaps and bounds. The history of these ten years would seem to indicate that the supply of capital and the amount of silver produced were not as closely connected as had been thought. It is possible, however, that larger amounts of private capital were invested in mines than had been the case in the years immediately preceding the organization of the Tribunal. There is scattered evidence that there was at least some private activity along these lines. Thus in 1779 the King approved the formation of a joint stock company to open up the old mines of Taxco, granting it extensive privileges in regard to the denunciation of mines and exemption from taxes.<sup>134</sup> In 1784 a company was formed

<sup>133</sup> It will be recalled that \$1,300,000 was raised but spent on gifts and loans.

<sup>134</sup> *A.G. Reales Cédulas*, vol. 117, No. 214; cf. below, p. 229.

to raise 20,000 pesos to work the mines of the "Cerro de San Pedro" in San Luis Potosí; <sup>135</sup> the money apparently was raised but the work did not prosper and operations were transferred to the Real de los Catorce.<sup>136</sup> Finally, in May of 1787 another company was formed to work mines in the neighborhood of Zacatecas; <sup>137</sup> whether or not it ever functioned, we do not know. While this evidence is rather inconclusive, it does show that some private capital was going into mines, and this may have accounted for some of the increased production after 1774. It is probable, however, that more of it was due to new discoveries and the opening up of rich deposits in the older mines.

With the conclusion that on the whole the *Banco de Avíos* failed to fulfill its primary purpose of financing mines during the first decade of its existence, we reach the end of this study of the financial aspects of the Tribunal. The chapter has been a long one, but the subject has been studied in detail, for several reasons. In the first place, this matter of finances was perhaps the most important before the Tribunal. The demand for capital was the strongest factor leading to its establishment, and it is important to know the manner in which it handled the large funds placed at its disposal through the sacrifice by the crown of a portion of its revenues. Then, too, the subject has a more general significance in the history of Mexico. The *Tribunal de Minería* was in theory an elected body of native Mexicans endowed by the crown with an unprecedented amount of independence and autonomous authority in the conduct of the nation's most important industry. The manner in which this responsibility was discharged is of some significance as an indication of the success to be expected when persons of this same general class — or a less able one — were entrusted with the welfare of the state as a whole. Finally this phase has been

<sup>135</sup> *Gaceta de México*, vol. I, Jan. 14, 1784.

<sup>136</sup> *Gaceta de México*, vol. I, No. 44, Aug. 9, 1785.

<sup>137</sup> *Gaceta de México*, vol. II, No. 36, June 5, 1787.



emphasized because so little has been written on the economic history of New Spain. No startling revelations have been made concerning the economy of the country, but there have been revealed, incidentally as it were, scattered facts which, taken with countless others yet to be gathered, may one day add to our general knowledge of this subject. Thus we have seen something of the scale of salaries and wages prevailing for different occupations; the rates of interest in effect have been indicated, as well as the cost of certain objects or services. Last, but not least, the careful auditing and accounting carried on by Monterde cannot fail to impress us with the ability and thoroughness of the officials of the Royal Treasury. Many just charges can be brought against the Spanish Administration in the New World, but, from the evidence we have studied, Monterde emerges as an ideal public servant, careful, well-informed, and zealous in the protection of the interest entrusted to him, in this case the safeguarding of the *Fondo Dotal* of the *Cuerpo de Minería*.

The principal factors which have entered into this study are best summarized in the five tables which are reproduced on the following pages and which indicate the net results of Monterde's audit of the Tribunal's accounts. Whereas the original account of the Tribunal showed a balance sheet with assets in excess of liabilities, the corrected account, after writing off those assets whose value was highly doubtful, showed a large deficit.

The conclusions which must be drawn from what we have seen need not be emphasized too strongly as they have been fairly evident throughout the study. During the period prior to the actual formation of the Tribunal, Lassaga and Velásquez de León appeared to be able individuals zealous in promoting the interests of the mining industry and, through it, the public good. From the facts brought out in this chapter, however, it appears that once Lassaga and Velásquez de León were charged with grave responsibilities, they shrank sensibly in stature.

In the handling of the finances by the Tribunal, there was an irresponsibility which came to be characteristic of future independent governments of the country as a whole. The desire to provide well for themselves and their friends seems to have taken precedence over their zeal to protect and administer wisely the funds of which they were but the trustees for the whole body of miners. It was a commonplace in Mexico, recognized by Lassaga and Velásquez de León prior to their assumption of authority, that miners were an improvident lot who soon dissipated the wealth that came to them in times of bonanza. When they found themselves with large funds at their disposal, the members of the Tribunal proved to be no better or wiser than their fellows in this regard. Final judgment must, of course, be delayed until we have completed our study of the other activities of the Tribunal.

The following five tables, incorporated in Monterde's final Report, serve as a connecting link between this chapter and the next. The first two tables summarize the material presented in this chapter showing the position of the funds of the bank as of December 31, 1787, first according to the Tribunal's own account, and then according to Monterde's more realistic view of the situation. The next three tables present various constant factors regarding income and expense which Monterde felt to be the starting point for any plan to rehabilitate the finances of the *Tribunal de Minería*. These lead us naturally to a consideration of the extensive investigation and reorganization of the Tribunal which took place during the years 1786 to 1793, as a consequence of the deplorable situation disclosed in the preceding pages.

275. 1a

**Manifiesto dividido en cinco Demostraciones, que hacen ver:**  
 La primera el Estado que segun las cuentas producidas por el Real Tribunal del im-  
 pante Cuzco de la Minera hasta 31 de Diciembre de 1787 tenian los fondos de  
 Banco en el mismo dia: La segunda el que en el propio se le debio conguar mas  
 pague: La tercera los productos que por menor se han verificado a los ocho granos por cada  
 Marco del Plata consignados para renta Dotal en los once años que se llevaban enajidos,  
 y el año comun que se deduce de ellos: La quarta los gastos ciertos en que estan hoy exara-  
 los anualmente los fondos del citado Banco, y la quinta lo que balanceado el importe de dicha  
 renta Dotal en un año comun con los gastos ciertos, resulta de sobranar en cada año.

## Demostracion 1.<sup>a</sup>

Estado del Banco en 31 de Diciembre de 1787,  
segun las cuentas producidas hasta dicho dia

### Tenia Existente

En la Real casa de Alameda en efectivos reales	179379. 4. 00.
En poder del Factor en los mismos	69228. 0. 11.
En el valor de la casa Colegio segun el en que se ajusto	319000. 0. 00.
En diversos créditos activos contra los Factores y otros Particulares	1549311. 4. 06.
En lo dado para habilitaciones de Minas de Azogue a quatro dueños de ellas	209106. 7. 06.
En lo que debian las veinte y una Negociaciones de Minas de Plata ariadas por el Banco	7259890. 4. 09.
<b>Importaban las existencias</b>	<b>9529116. 5. 08.</b>

### Estaba responsable

A los fondos de Temporalidades a quien se tomaron a ruios de una p. r. r. r.	3009000. 0. 00.
A los del R. Colegio de Abogados a quien se tomaron en iguales terminos	119000. 0. 00.
A la Testamentaria de la señora doña Maria Ignacia Rodriguez, y Montado: a quien se tomaron en la misma forma	109000. 0. 00.
A la Casa de la señora doña Maria Josepha Salmonte y Jalasca p quien se tomaron en los propios terminos	89000. 0. 00.
Al Hospicio de San Nicolas de esta Ciudad por arrendacallos sobre el la casa del Colegio Realico con obligacion de dichos r. d. r.	249000. 0. 00.
Al fondo de lo que se cogio para la Paga de r. d. r. del millon de pesos prestado a S. M.	109186. 3. 00.
Al Deposito de los Bienes vendidos de los embargados al Jorior don Aniceto del Barrio	169182. 6. 07.
<b>Importaban las cantidades a q. estaba responsable</b>	<b>3799969. 1. 07.</b>

### Comparacion

Importaban las existencias que tenia en 31 de Diciembre de de 1787, segun lo que consta de las cuentas	9529116. 5. 08.
Importaban las cantidades a que estaba responsable a mismo citado dia	3799969. 1. 07.
Tenia el Banco liquidos segun sus cuentas	5729147. 4. 01.

## (1) Demostracion 2.<sup>a</sup>

Estado mas venturo que toma el Banco  
el dia 31<sup>o</sup> de Diciembre de 1787.

Importaban el total de sus existencias como se ha figurado 9529116.5.08  
Bajarse de ellas por  
de mala calidad.

Los diversos creditos activos contra los Pae. teros y otros Particulares	1649311.1.06	}	
No bazo para habilitacion de quatro De. pendencias de Minas de Lague	209106.7.06		
Lo q <sup>e</sup> debian las 21 Negociaciones de Minas de Plata	725989.4.09		
Quedaba reducida la existencia de buena calidad a	519807.1.11		

### Comparacion.

Importaban las cantidades a que estaba res.  
ponsable el Banco segun la Demostracion 1.<sup>a</sup> " 979969.1.08

Importaban las existencias de buena calidad,  
segun la presente Demostracion " 519807.1.11

Estaba descubierto el Banco en " 3289161.1.06

## Demostracion 3.<sup>a</sup>

Producto de los ocho granos por cada Marco de  
Plata de Sey once dineros que se consignaron por el  
Artic.<sup>o</sup> 1.<sup>o</sup> Titulo 16 de las Ordenanzas para Renta Total  
del Banco.

Desde 13 de Enero de 1777, que tubo prin- cipio la emacion hasta 31 de Diciembre del mismo.	1319617.3.06	}	
En todo el año de 1778	1539487.7.00		
En todo el de 1779	1579911.5.06		
En todo el de 1780	1519667.1.00		
En todo el de 1781	1609592.2.00		
En todo el de 1782	1389613.6.06		
En todo el de 1783	1829655.1.00		
En todo el de 1784	1649306.5.00		
En todo el de 1785	1459598.2.06		
En todo el de 1786	1939751.6.06		
En todo el de 1787	1409795.0.06		

Suponiendo sea once años completos los nominados  
por solo faltarle doce dias, se deducen por un  
Año comun

1619005.6.08

## Demostacion A.ª

Gastos ciertos en que estan hoy axarados los fondos del Banco anualmente.

### Salarios.

El del Señor Juez de Vizcaya	19000.0.00.	} 219225.0.00.
El del Director	13000.0.00.	
El del Diputado Sierra	13000.0.00.	
El de los Diputados Barrios y Balmori á tres mil p.	63000.0.00.	
El del Señor Asesor	13700.0.00.	
El del Secretario	28500.0.00.	
El del Secretario	13200.0.00.	
El de su Oficial mayor	3000.0.00.	
El de su Oficial segundo	3300.0.00.	
El del Ministro Asesor Ponce	3300.0.00.	
El del Procurador	3100.0.00.	}
El del Ponce del Colegio	200.0.00.	
El del Abogado	9025.0.00.	

### Exaltificaciones á los Ministros y subalternos de la Real casa de Moneda.

La del Señor Superintendente	9600.0.00.	} 39300.0.00.
La del Contador	3200.0.00.	
La del Tesorero	9500.0.00.	
Los de los Oficiales mayores de Contad.ª y Tesorería á 300 p.	9600.0.00.	
Los de los segundos á lo mismo	9600.0.00.	
Las de los demas Oficiales de las propias dos oficinas al cubierto de sus Gjes á cien y cincuenta p.	2300.0.00.	
La del Escribano	3100.0.00.	}
Las del Ponce y Mariscal á cien pesos mientras subsiste la necesidad de dar Joynagulas	3200.0.00.	

### Asignaciones.

La de la casa del Conde Señor Marques de Sonora	19000.0.00.	} 100800.0.00.
La de los tres menores hijos del Difunto Agente de Madrid don Martin Sanchez Munizán á cien pesos cada uno hasta que tomen estado	3300.0.00.	
La de las dos hijas del señor Director Difunto don Joaquín Velasquez, quinientos á la casada, y un mil á la doncella, que si toma estado se reducirá tambien á quinientos	19500.0.00.	
La de la Real Academia de San Carlos	59000.0.00.	

### Reditos de cinco por ciento

Los de trescientos mil pesos que se deben al fondo de Impoponabilidades	159000.0.00.	} 172650.0.00.
Los de once mil pesos que se deben al Real Colegio de Abogados	3500.0.00.	
Los de diez mil pesos que se deben á la Testamentaria de la Señora Doña Maria Donacia Rodriguez y Monizada	3500.0.00.	
Los de ocho mil pesos que se deben á la casa de la Señora Doña Josepha Salazar y Jofre	3000.0.00.	
Los de veinte y quatro mil pesos que reciben la casa del Colegio Metálico	19200.0.00.	


### Diversos gastos con preparacion de lo que importaron en años anteriores

El de la Fiesta de la Santisima Virgen de Guadalupe	3375.0.00.	} 3969.0.00.
El de Fiestas de Cantas y demas de Oficio	3100.0.00.	
El de Contagionados	300.0.00.	} 539500.0.00.
Importe total de los gastos anuales que en el pie en que estan hoy el Gobierno		

Demostxacion 5.<sup>a</sup>  
Yalance de la Renta Doial  
con los gastos.

Regulanse de Renta en un Año comun segun la De-	
mostxacion texcxxx	<u>.1519</u> op 5.6.00
Conceptuanse de gastos por el actual pie del Tribunal	
segun la Demostxacion quaxia	<u>5295</u> 1/2 o.00
Sobxante anual de la Renta	<u>9724</u> 6.00

Mexico 25 de Noviembre de 1788.

Pedro Maria  
 Alvarado  


## CHAPTER IV

### THE INVESTIGATION AND REORGANIZATION OF THE TRIBUNAL, 1786-1793

MOST OF THE FACTS relating to the finances of the Tribunal discussed in the last chapter came to light as part of the extensive investigation and reorganization which took place from 1786 to 1794. This reorganization was a phase of the Tribunal's history important not only for itself and for the changes which it wrought in the structure of the *Cuerpo de Minería*, but also because of the numerous discussions it provoked regarding all aspects of the Tribunal's activities. Before we plunge into the detailed story of the *arreglo*, as it was called, a word of caution must be given. The reorganization was not effected all at once; rather it extended over eight years and was the sum of a considerable number of gradual changes. Hence, while following this theme, it will be necessary constantly to remember that all through the *arreglo* the Tribunal was carrying on most of its regular duties. The latter will be described below, but here it should be remembered that this chapter represents an evolution rather than a revolution and one which, with some exceptions, did not interrupt the regular functioning of the Tribunal.

The *arreglo* may be said to have begun with the death of the first administrator-general on February 7, 1786. The first actual step in the investigation was the Viceroy's order of February 27th to the Tribunal demanding the accounts of its operations from its foundation.<sup>1</sup> Before these could be prepared the Tribunal suffered another loss in the death of the Director-General, Joaquin Velásquez de León, on March 6th. Thus within a month the two founders of the Tribunal died,

<sup>1</sup> Cf. chap. iii, p. 80, for a summary of this Order.

leaving its two most important positions vacant, and bringing to a close the first chapter in its existence.

The resulting situation is best described in a dispatch of the Viceroy to the King dated March 31, 1786.<sup>2</sup> After recounting the death of the two ministers and his order of February 27th, he said that he had previously given verbal instructions that, notwithstanding Art. 12 of Tit. 1 of the Ordinances, the Tribunal should not proceed to the election of an ad interim administrator general but await the triennial Junta General in December. He did this because, although there was a vacancy among the deputies-general due to the death of Antonio Villanueva, he felt the Tribunal could continue to discharge its duties with the aid of the *consultores* named to substitute for ill or absent members. Furthermore, he reported discontent with the Tribunal in some of the *reales*, particularly Guajuato, and described the failure of the Tribunal to prosper as had been hoped, especially along financial lines. He said that, after receiving the reply to his order of February 27th, he hoped to be able to take the measures necessary to prevent further losses and to begin the financial rehabilitation of the Tribunal. As part of such action he felt it his duty to inform the Marqués de Sonora of the situation, and especially of the number of candidates for the important positions of administrator and director-general and their general lack of fitness. Specifically he felt that there was no one in Mexico of sufficient training and ability to fill the post of director-general, and recommended that the King send over a scholar of the first order to discharge the important duties of that office.

In the meantime, while this first report on the parlous state of affairs within the Tribunal was being written to the Court, the Tribunal replied to the Viceroy's order of February 27th. On March 30th, the two remaining deputies-general, Julián Antonio del Hierro and Ramón Luis de Liceaga, and one of the

<sup>2</sup> Conde Gálvez to Marqués de Sonora, Mexico, Mar. 31, 1785; *A.I., Sec. 5<sup>o</sup>, Aud. de Méx., Leg. 2250*.



*consultores*, the Marqués del Apartado, forwarded the various accounts demanded the preceding month.<sup>3</sup> It is not necessary to examine these accounts in detail as the later general and special ones already studied include all the information brought out in these as well as some additional facts. Enough of the salient points, however, were included to show clearly that the financial affairs of the Tribunal were not flourishing.

The Viceroy wrote the Tribunal on April 22d, criticizing a number of the items, demanding much more complete information on the financing of mines, and ordering the Tribunal to proceed immediately with the collection of all sums due it. He also gave instructions that no offices in the Tribunal should be filled until the King had determined what measures he wished taken.<sup>4</sup>

On April 29th the Viceroy again wrote the Minister of the Indies, enclosing copies of the accounts furnished by the Tribunal and of his order of April 22d. He made little comment except to call attention to the seriousness of the situation, his own temporary measures, and to urge speedy action by the Royal Government.<sup>5</sup>

The scene of action now shifts temporarily to Spain whence came a series of royal orders dealing with the affairs of the Tribunal. The first, dated May 27th, was a brief emergency one and was as follows:

In connection with the death of Don Juan Lucas de Lassaga, Administrator General of the important *Cuerpo de Minería* of this Kingdom, there have been brought to the notice of the King, the great losses which its funds have suffered through the mistaken actions and badly advised expenditures which this Tribunal has made; and not-

<sup>3</sup> The dispatch together with the accounts are in *A.I., Sec. 5<sup>a</sup>, Aud. de Méx.*, Leg. 2240.

<sup>4</sup> The original of this dispatch is missing; a copy, however, is in the expediente entitled, *Gobierno del Real Tribunal de Minería, A.G. Minería*, vol. 30, ff. 483-567, Sec. 5; this expediente is a useful but incomplete summary of the early part of the *Arreglo*.

<sup>5</sup> *A.I., Sec. 5<sup>a</sup>, Aud. de Méx.*, Leg. 2240. There is another copy of the Order of April 22 attached to this letter.

withstanding that by the next post I will communicate to Your Excellency the resolutions which His Majesty has taken in order to remedy the damage already caused and prevent its recurrence in the future, he has ordered me to instruct you today to suspend immediately every enterprise and the provision of all supplies which the said Tribunal has made to various miners, that likewise the election to fill the vacant office of Administrator General should be suspended; that the Director Don Joaquín Velásquez de León should immediately give up the office of Assessor, the same being conferred for the time being on the Judge, Don Eusebio Bentura de Beleña; that an examination should be made with the attendance of the fiscal of the Royal Hacienda of the management and investment of the funds of the said *Cuerpo de Minería* since the establishment of these funds; that Your Excellency should name two subjects of good character and agreeable to the merchants and *aviadores* of the Capital in order that in the capacity of Adjuntos they should attend the sessions of the Director and Deputies of the *Tribunal de Minería* on economic matters and give you an account of all the important matters which are discussed in the meeting since nothing is to be done without the specific approval of Your Excellency.<sup>6</sup>

As will be seen, this was dispatched before the receipt of any of the Viceroy's letters on the subject and leaves the source of the King's information anonymous. This bears out an allegation made later by one of the members of the *Junta de Arreglo* that the King's mind had early been poisoned by malicious and prejudiced persons bent on placing the Tribunal in a bad light.<sup>7</sup> What these sources were we do not know, but it is possible that they were some of the discontented elements in Guanajuato to which the Viceroy referred in his dispatch of March 31st, and which had objected to the extra tax imposed in connection with the loan in 1782. At all events the information must have appeared sufficiently important to warrant this immediate action. When it was received in Mexico, the Viceroy ordered a copy sent to the fiscal of the Hacienda, as well as to the Tribunal, with the provision that the two

<sup>6</sup> Marqués de Sonora to Conde de Gálvez, A.G. *Reales Cédulas*, vol. 134, No. 53.

<sup>7</sup> Cf. below, pages 176, 186.

clauses dealing with the suspension of loans and the appointment of two merchants should be temporarily suspended because of his own orders and until the King should reply to his dispatches.<sup>8</sup>

The dispatch of May 27th was followed a few days later by a more comprehensive royal order setting in motion the machinery for definitive reforms in the Tribunal — likewise sent before the receipt of the Viceroy's report of March 31st.<sup>9</sup> It stated that the time had now come to "proceed to the formal *arreglo* of the government and administration of the *Cuerpo de Minería*," to which end the following instructions were given:

(1) A junta should be held to be composed of the ministers of the Tribunal and such other informed and able persons as the Viceroy might deem fit to appoint, together with the fiscal of the Hacienda. This should investigate the causes of the decadence of the Tribunal and suggest measures of reform — including, if necessary, the temporary modification of the Ordinances. It should consider all aspects, but especially elections and appointments to the Tribunal, the powers of the latter, salaries, and all the matters connected with finances. The decisions of the junta should be sent to the King for approval and final action.

(2) This same junta should decide whether two delegates from the *Cuerpo de Comerciantes y Aviadores* should continue to sit with the Tribunal in *Acuerdo* (as provided in the Order of May 27th) and if so in what capacity.

(3) A strict accounting should be made of the condition of the *Fondo Dotal* under the supervision of the fiscal of the Hacienda — with full details of all receipts and expenditures. (This was done through various accounts and Monterde's audit discussed in the preceding chapter.)

(5) In order to regulate the financial administration in the future, accounts should be closed at the end of each year, audited by the *Tribunal de Cuentas*, and sent to the King for final approval.

<sup>8</sup> "Gobierno del Real Tribunal . . .," *A.G. Minería*, vol. 30, ff. 483-567, Sec. 7., *A.G. Minería*, vol. 48, exp. 4, No. 27.

<sup>9</sup> Marqués de Sonora to Conde Gálvez, June 7, 1786, *A.G. Reales Cédulas*, vol. 134, No. 79.

(6) As the existing bad condition had arisen largely from excessive salaries and advances to the miners for their own maintenance, the former should be reduced to a reasonable figure and the latter should cease entirely, since the miners should maintain themselves from the produce of their mines and the *Fondo Dotal* was established only to loan capital for the actual development and operation of mines themselves upon proper security.

(7) All money found to have been expended in violation of the Ordinances or without proper investigation and security, should be charged against those responsible, who should be required to pay it and be suspended from their employment.

(8) A portion of the annual income should be set aside each year to liquidate existing debts, and no new ones should be contracted without urgent cause and the approval of the Viceroy and the Royal Government.

While these two orders were on the way to Mexico, the Viceroy's dispatch of March 31st was received in Spain. On July 19th the Minister of the Indies replied acknowledging receipt of the news of the death of Lassaga and Velásquez de León and the condition of the Tribunal's affairs which had become apparent. He informed the Viceroy that in view of these circumstances the King had resolved that the elections called for in the Ordinances should be dispensed with for this occasion. Instead he had appointed as director, Fausto de Elhuyar, a young Spanish mining engineer,<sup>10</sup> and the deputy-general Julián Antonio del Hierro as administrator-general. This left Ramón Luis de Liceaga as senior deputy, and to fill the two vacancies the King appointed two persons belonging to the commercial fraternity of Mexico — Don Antonio Barroso and Don Antonio Basoco — thus following the policy indicated in the order of May 27th. These persons were ordered to begin their new duties immediately and the Viceroy was

<sup>10</sup> On July 18, the Marqués de Sonora had written to Elhuyar, then studying in Vienna, informing him of his appointment, which the latter acknowledged on Sept. 9. (*A.I., Se. 5, Aud. de Méx., Leg. 2250.*) The details of this, and Elhuyar's preparation for his new duties, will be more fully discussed in the chapter on Education.

instructed to make known at the proper time the suspension of the duties of the junta general as far as the election of ministers of the Tribunal was concerned.<sup>11</sup>

This order, though relatively brief, was of great significance. In the first place it changed, at least for the time being, the character of the Tribunal by substituting royal appointment of its officials for election by the delegates of the body as a whole. Furthermore, by including two merchants on the Tribunal, it departed from the principle laid down in the Ordinances that all the deputies should be experienced miners. These two developments may be said to have been contrary to the original conception of the Tribunal and as such setbacks to its own interests. Of much greater permanent importance was the appointment of Elhuyar as director-general.

Fausto de Elhuyar was born in Logroño, in northern Spain, on October 11, 1757. While still in his teens he visited Paris to study natural sciences, returning to Spain in 1776, where he spent a year teaching mineralogy at the Seminary of Vergara. In 1777 he again went abroad to study, this time as a pensioner of the *Real Sociedad Vascongada de los Amigos del País*, accompanied by his brother Juan José, who was sent at the expense of the crown. The brothers went first to Freiberg and subsequently traveled and studied in Sweden, Norway, and England. Fausto returned to Spain in 1781 and is said to have resumed his teaching at Vergara and to have published a study on wolfram which made his reputation.

In 1785, at the instigation of the Marqués de Sonora, the crown sent him to Austria to study the Born process of amalgamation. In the course of this trip he visited mines in Styria, Carinthia, Carniola, and the Tyrol, and is reported to have married in Vienna, in 1786, Juana Raab de Monalos, the daughter of an imperial counselor. It was while in Vienna that

<sup>11</sup> Marqués de Sonora to Conde Gálvez, July 19, 1786, *A.G. Reales Cédulas*, vol. 134, No. 135.

he received the letter from the Marqués de Sonora appointing him director of the Mining Tribunal of New Spain.<sup>12</sup>

At first glance it might seem that the appointment of a European instead of the election of a Mexican constituted a further blow to the autonomy and interests of the *Cuerpo de Minería*. It turned out to be quite the opposite. For the rest of its existence, Elhuyar was the outstanding personality in the *Tribunal de Minería*. Notwithstanding his royal appointment, he served the mining industry of Mexico with far more zeal and disinterestedness than did some of its own members elected to positions of responsibility. He was always active in the promotion of its well-being and never betrayed its interests even when the latter were in conflict with the wishes of the royal government. He will be with us constantly during the rest of this study, and his ability and value to the miners of New Spain will best show through the record of his distinguished services and constant activity in many fields. Here, however, we should pause to pay tribute to the oft-maligned government of Spain for its wisdom in seeing the need of filling this position with a man of thorough technical training and education, and in keeping him in his position for over thirty years. That the appointment was largely due to José de Gálvez is but another proof of the greatness of that minister and of his keen understanding of the true situation in Mexico gained from extensive personal observation.

<sup>12</sup> This biographical material on Elhuyar prior to his appointment to New Spain is based on Arturo Arnaiz y Frez, "D. Fausto de Elhuyar y de Zubica," *Revista de historia de América*, No. 6, pp. 75-96; and Arthur P. Whitaker, "More About Fausto de Elhuyar," *Revista de historia de América*, No. 10, pp. 125-130. A number of minor inaccuracies in Arnaiz will be noted when we return to Elhuyar's preparation for his new task. The report of his marriage, while possibly true, is not confirmed by any references in the official correspondence relating to him which I have seen. It appears certain that much more light is shed on Elhuyar in Dr. Clement E. Motten's at present unpublished doctoral dissertation on "Mexico and the Enlightenment." While I have not had the opportunity to read this study, correspondence with Dr. Motten suggests that it will add greatly to the material on Elhuyar contained in the present work.

The next step in the progress of the arreglo did not show such broad vision or understanding. Sometime about the end of July the Viceroy's dispatch of April 29th with the enclosed account of the Tribunal was received in Spain. On August 12th the Marqués de Santa Cruz submitted a report which was the basis for another royal order a few days later. The report<sup>13</sup> is not altogether fair to the Tribunal. It criticized strongly all the irregularities with which we have become thoroughly familiar, but some of the comments showed ignorance of the true destination of the expenditures. Thus the Tribunal was censured for including on the side of receipts the 300,000 pesos borrowed from the Temporalidades but not including the 1,000,000 pesos for which it was borrowed; we have seen that this 300,000 pesos did not go towards the 1,000,000 pesos but for a gift to the crown for the dock works of Coazacoalco. Likewise, the report criticized the Tribunal for not giving in detail the destination of the other 150,000 pesos listed as gifts — when it must have been well known that the money went to the Princes of Asturias. In another place the report assumed that the reason the million pesos was not included in the account was because it had been paid back! Much of the criticism in the report was just and anticipated the later judgments brought by Monterde on the basis of the complete accounts. It does indicate, however, that the crown either was not conscious of or chose to ignore the embarrassment for which it itself was responsible in the funds of the Tribunal. Unfortunately this continued to be the case and must always be kept in mind when considering the financial aspects of the Tribunal. The dispatch from the crown<sup>14</sup> based on this report included its criticisms, ratified the Viceroy's provisional order of April 22d, and commanded the immediate execution of the royal orders of May 27th and June 7th.

These orders were received in Mexico in late November,

<sup>13</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2240.*

<sup>14</sup> *A.G. Cédulas, vol. 134, No. 186.*

1786, and were forwarded to the Tribunal by the *audiencia gobernadora* with the instructions for prompt compliance.<sup>15</sup> On December 1st, the *audiencia* informed the Marqués de Sonora that del Hierro had taken office as administrator-general and Barroso and Basoco had been installed as deputies-general. The *audiencia* stated that the other clauses of the order of June 7th had been referred to the fiscal of the Hacienda for his advice as to how they should be put into effect.<sup>16</sup>

These royal orders had been communicated to the fiscal on November 23d,<sup>17</sup> and on January 18, 1787 he rendered his opinion which covered six distinct points.<sup>18</sup> First, he expressed his surprise that the Tribunal had apparently taken no notice of any of the dispatches of the Viceroy since that of April 22d; and, therefore, requested that an order be sent to the Tribunal immediately requiring it to cease furnishing maintenance to miners, forbidding the contraction of any new debts whatsoever, and ordering it to reduce all pensions and expenses immediately, even though they might be in connection with mines actually in operation, until the reorganization of its administration should be accomplished. Second, in order to effect this reorganization he recommended that a junta composed of suitable persons be convened immediately and take under consideration the modification or reform of the Ordinances, all the documents bearing on this subject to be placed before the junta. Third, in order to give effect to the order requiring an audit of its accounts, he advised that the Tribunal be commanded to draw up and present a clear and detailed

<sup>15</sup> *A.G. Minería*, vol. 48, expediente No. 4, Doc. No. 28; the Viceroy Conde de Gálvez died on November 30, 1786; he had put the government in the hands of the *audiencia* on November 16th; Bancroft, *op. cit.*, III, 398.

<sup>16</sup> This is "Carta No. 28" of the *Audiencia Gov.*; it is missing from the series in Mexico, but is in *A.I.*, Sec. 5<sup>a</sup>, *Aud. de Méx.*, Leg. 2250.

<sup>17</sup> *Gobierno . . . del Real Tribunal de Minería*, *A.G. Minería*, vol. 30, ff. 483-567, Sec. 11.

<sup>18</sup> *Ibid.*, Sec. 12, copy enclosed in letter of Posada to Marqués de Sonora, June 26, 1787, *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2238.



account of all its receipts and expenditures from its inception to the date of the report, together with complete files of the vouchers and substantiating documents. Fourth, in addition to this account, he said the Tribunal should present a comprehensive statement covering the twenty-three mines financed, showing the reasons for the suspension of ten of them, the prospects for the remaining thirteen, and all other relevant information.<sup>19</sup> Fifth, he recommended that the demands made in the order of April 22d for the repayment of various sums which should be found to have been expended in violation of the Ordinances should be suspended until the formal accounts referred to above had been presented and audited; but, sixth, that there be no delay in enforcing recovery of the items specifically mentioned in the royal orders as irregular, such as the shortage of the factor, Barrio, and the amount paid to the *regidor*, Rodriguez, for the bullfight which was never held.<sup>20</sup> On April 26th the *audiencia gobernadora* issued a decree embodying the recommendations of the fiscal,<sup>21</sup> and on April 30th it sent eleven separate orders to the Tribunal, covering his specific requests and points one, three, and four of the general report.<sup>22</sup> The Tribunal answered most of these specific demands fairly promptly and in general in a manner which was not entirely satisfactory.<sup>23</sup>

About this time another royal order was received in reply to the reports from Mexico of the preceding autumn.<sup>24</sup> This approved the actions of the Viceroy — the Conde de Gálvez — of the preceding year and said that in view of the manner in

<sup>19</sup> These are the accounts and statements discussed in the preceding chapter.

<sup>20</sup> Copies of these demands are in *Gobierno . . . del Real Tribunal, op. and loc. cit.*, Sec. 13.

<sup>21</sup> *Ibid.*, Sec. 14.

<sup>22</sup> *A.G. Minería*, vol. 48, expediente 6, ff. 129-139.

<sup>23</sup> *Gobierno . . . del Real Tribunal, op. and loc. cit.*, Sec. 15; the new Viceroy had to repeat the demands on June 13th in order to get some of the information requested. *A.G. Minería*, vol. 48, expediente 6, Nos. 19-20.

<sup>24</sup> Marqués de Sonora to Archbishop Haro, Feb. 26, 1787, *A.G. Reales Cédulas*, vol. 136, No. 98.

which the arreglo was progressing the King had decided to modify the earlier order for the suspension of all financing of mines. It gave instructions that the Tribunal should be permitted to continue advances to the mines already financed which promised an eventual profitable return, but that all others should be suspended. Furthermore, in every case the decision of the Tribunal was to be submitted to the fiscal of the Hacienda and the final decision made by the Superior Government. Except for this modification, all the instructions contained in the earlier orders were to be put in force promptly, especially that summoning a junta to consider all aspects of the arreglo and submit its findings to the King for approval.

In the meantime another problem had arisen through the death on April 24th of the recently appointed administrator-general, Julián del Hierro. The Tribunal on April 26th reported his death and asked whether it should proceed to the choice of a successor, or suspend this for the time being in view of the arreglo. The Archbishop and acting Viceroy replied that in view of the most recent royal orders and the junta which was to be held, the choice of a new administrator should be suspended and the senior deputy should perform his duties.<sup>25</sup>

As it was now clear that there could be no further real progress until the *Junta de Arreglo* met, the Viceroy on June 5th issued a decree naming its members, and setting June 9th for the first meeting; the following were the persons appointed to the junta: Don Eusebio Bentura Beleña, Don Cosme de Mier, Don Ramón de Liceaga, Don Antonio Barroso, Don Antonio Basoco, Col. Antonio Vivanco, Don Juan Francisco Echarri, Don Juan Antonio Slermo (?), Don José de Castañeda, Don Manuel Ramón de Goya, Don Joaquín Dongo.<sup>26</sup>

The junta met as ordered on June 9th. The latest royal orders and the report of the fiscal of January 18, 1787 were read to the members and they agreed that each one of them

<sup>25</sup> A. G. *Minería*, vol. 48, f. 147.

<sup>26</sup> *Gobierno del Real Tribunal*, *op. cit.*, Sec. 16.

should be given a copy of the royal order of June 7, 1786, and of the *Ordenanzas de Minería* for their study and consideration. The junta then adjourned after setting the 17th of June for the next meeting.<sup>27</sup> On that date the junta listened to the report of the fiscal and the replies of the Tribunal to his earlier requests, which had now been received. The members of the junta thereupon agreed that copies of these replies should be attached to the other documents presented for their information and that the Tribunal should proceed without further delay to form the General Account, attaching to it all substantiating documents and carrying the account down to the end of the current month of June 1787. It also directed the secretary to draw up a summary of all these documents and accounts, which should be furnished the junta in order that it might examine the causes of the decay of the Tribunal and agree on proper measures to promote its recovery. After adopting these and a number of minor resolutions, the junta adjourned, subject to the call of the Viceroy.<sup>28</sup>

In notifying the Tribunal of these resolutions the Viceroy advised it that in accord with Art. 3 of the royal order of June 7, 1787, the fiscal had appointed Pedro María de Monterde of the *Tribunal de Cuentas* to audit the accounts of the *Tribunal de Minería*, and ordered the latter to present its accounts to him and make available all the documents which he might require.<sup>29</sup>

Meanwhile the Tribunal had forwarded a statement showing the existing scale of salaries and wages compared with those projected in the Representation of 1774. These statements showed that while the expenses of the Tribunal had been estimated at \$22,400 and of the College at \$27,600 or a total of \$50,000 per year, the actual cost of the Tribunal in 1787 came to \$25,000. It should be noted, however, that at this time the

<sup>27</sup> *Ibid.*, Sec. 17.

<sup>28</sup> *A.G. Minería*, vol. 48, expediente 6, No. 27.

<sup>29</sup> *A.G. Minería*, vol. 48, expediente 23.

School had not as yet been started and the director's salary was included as an expense of the Tribunal.

The junta reassembled on July 21, 1787, with the above statement before it. An examination of this caused a number of questions to be raised which, while they were not settled for some years, vitally affected the future of the Tribunal. These included such matters as the number of members the Tribunal should have and their salaries, the method of their election and qualifications, and the functions they should exercise. Of particular interest was the question whether all the members should be miners, as required by the Ordinances, or whether it would be wise to include one or more merchants. The junta agreed that each member should express his views on these topics in a written opinion which, in conformity with the royal order of June 7, 1787, he would have to draw up on all the other points concerning the reorganization of the Tribunal. By this time the Tribunal had presented its General Account, and the junta therefore adjourned to await the audit to be made by Monterde as representative of the fiscal of the Hacienda.<sup>30</sup>

The long period during which Monterde was examining the accounts and drawing up his report represents a pause in the progress of the arreglo. In October the Viceroy ordered Monterde to complete his audit as soon as possible and instructed his office to get back the files concerning the mines financed and draw up summaries of them to be presented to the new junta.<sup>31</sup>

This brings to a close the events of the year 1787, and with it the first stage in the reorganization of the Tribunal — the stage during which the machinery was put in motion and many matters needing determination were brought up for discussion. Two features have become evident from the consideration of

<sup>30</sup> The above information concerning the July 21st meeting of the Junta is in *Gobierno del Real Tribunal*, *op. and loc. cit.*, Sec. 23.

<sup>31</sup> *Ibid.*, Sec. 24.

this first phase. The investigation and need for some reform were brought about almost entirely by the bad financial management disclosed in the preceding chapter; but, once the reorganization was started, it did not limit itself merely to reforming and safeguarding the handling of the funds and accounts of the Tribunal, but went into matters concerning the very form and structure of the Tribunal itself. Through the appointment of Elhuyar as director and Barroso and Basoco as deputies, the Tribunal had lost, at least for the time being, its character as an elective body representing the mining industry, and was threatened with still further changes. Before we pass on to the later stage of the arreglo, when the future course was decided, we may well pause to examine some reflections and opinions on the Tribunal and the mining industry which these first disclosures produced.

On March 26, 1787, Don Miguel Pacheco Solís wrote the Marqués de Sonora at great length, setting forth his views on the condition of the Tribunal and the *Banco de Avíos* and making suggestions for their improvement.<sup>32</sup> Inasmuch as Pacheco Solís was one of the miners financed by the bank whose loans were considered highly irregular by Monterde, it might be expected that he would defend the lax policy of Lassaga and Velásquez de León. On the contrary, he was highly critical of the past management, disapproving its choice of mines and implying that more generous grants should have been made to his own enterprise. In making recommendations for the future, he suggested that the administrator and one deputy be Europeans appointed by the King and that appeals in mining cases be taken to the audiencia. He also recommended that the *Banco de Avíos* continue to finance mines but with a larger capital and more careful inspection and supervision of those financed. With these modifications, and leaving aside personalities, he believed sincerely in the fundamental soundness of the system established by the Ordinances, in spite of the weaknesses it had exhibited.

<sup>32</sup> *A.I., Sec. 5<sup>a</sup>, Aud. de Méx., Leg. 2241.*

Not long after Pacheco wrote his discourse the judge Don Eusebio Bentura de Beleña sent a report to the Marqués de Sonora.<sup>33</sup> He had been appointed assessor of the Tribunal by the royal order of May 27, 1786, and hence, while his point of view was that of a lawyer, he was familiar with the Tribunal. He believed that financing of mines under the existing premium system was unsound and recommended instead that in the future the bank make only straight loans to miners at 3 per cent interest and with specific pledges or guarantees for the repayment of the principal. He also suggested a considerable number of changes in the Ordinances most of which were designed only to simplify them and make them easier to enforce, although they tended to give greater importance to lawyers in the administration of the affairs of the *Cuerpo de Minería* at the expense of the miners themselves.

Still a third point of view was presented by the fiscal of the Hacienda in a commentary of this same period.<sup>34</sup> He proposed much more serious reforms than the other two in the financial administration of the Tribunal, recommending that all financing of mines, gratifications to individuals, and extraordinary expenses be prohibited without the express approval of the King in each case. Instead of financing individual mines directly as it had done in the past, Posada recommended that the Tribunal use its surplus funds to promote public works of benefit to a whole district—such as drainage projects, reforestation, and road building. He also urged that the members of the Tribunal be required to furnish bonds of \$10,000 each and that all their accounts be audited by the *Tribunal de Cuentas* before these bonds could be released or the officials reelected. With these changes Posada favored the continuation of the Tribunal and the *Diputaciones Territoriales* which he believed would be of great use to the mining industry and the country.

<sup>33</sup> May 24, 1787; *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2238.

<sup>34</sup> Ramón de Posada to the Marqués de Sonora, June 25, 1787, *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2238.

Although these three individuals each had a different opinion as to the changes that should be made, they all agreed that the general system of the Tribunal and *Diputaciones Territoriales* was useful and should be continued. This fact is particularly interesting in view of their further unanimous opinion that the affairs of the Tribunal had been scandalously mismanaged in the past.

Inasmuch as we have only seen this one side of the picture which portrayed the Tribunal in the blackest of colors, it is only fair to glance at a defense of its conduct which appeared about this time.<sup>35</sup> Most of this was devoted to defending the Tribunal's handling of avíos. The burden of the argument was: Much of the money spent thus far had gone into development work which was necessary before production could begin; only five of the twenty-one enterprises had been proven worthless; if the financing were continued, most of the mines would soon begin to produce ore on a profitable scale and the bank would be repaid all that it had advanced. If, on the contrary, it was not possible to resume operations in the near future, there was a good chance that much of the investment would be lost. The attorney said that the Tribunal could not be blamed for the failure to carry the financing through to the point of productive return, citing the refusal of the fiscal to permit borrowing from the fund of the Temporalidades and the order of the crown suspending all financing. He argued that all loans had been made strictly in accordance with the Ordinances and that most of the charges had originated with disgruntled individuals. He objected to several of the measures taken by the crown, particularly the appointment of Beleña as assessor for the Tribunal and the requirement that the Viceroy be informed of all important matters pending before the Tribunal, alleging that this led to interminable delays and injustice, as the civil officials were not familiar with mining. Pointing out that it was for just

<sup>35</sup> *Representación del Apoderado del Tribunal de Minería . . . on Madrid*, Aug. 29, 1787, A.I., Sec. 5, Aud. de Méx., Leg. 2238.

these reasons that the Tribunal was founded, he repeated that the latter had been slandered and that the faculties and privileges conceded it in the Ordinances should be restored to it.

There is justice in the attorney's argument that in mining much development work is necessary before production can begin and that the original investment might be lost if the financing could not be carried to the point of production. Inasmuch as the financing had only begun in 1784, the government may well have been over-hasty in criticizing the fact that so little of it had been returned. On the other hand, with the knowledge which we have from del Hierro's notes of the manner in which many of the mines were chosen, it is impossible to exculpate the Tribunal.

Before returning to the progress of the arreglo there are a number of developments of 1788 and 1789 which should be mentioned. Early in the year 1788, Don Antonio Basoco, one of the merchants appointed to the Tribunal in 1786, resigned. Instead of appointing a successor the Viceroy instructed the Tribunal to elect an ad interim deputy as soon as possible.<sup>36</sup> Until this was done the Tribunal was very shorthanded, having only two deputies Liceaga and Barroso. In May, however, these two chose Don Domingo Valcarcel as deputy ad interim, and later in the year the Tribunal was further reinforced by the arrival of the new director.<sup>37</sup>

On August 20, 1788, Fausto de Elhuyar arrived in Veracruz and notified the Viceroy that he was starting for Mexico immediately accompanied by several German mining experts sent over by the King.<sup>38</sup> He had been appointed director of the Tribunal in July of 1786, and since that time he had been preparing himself for his new position by firsthand observation of mining methods in Europe.<sup>39</sup> He immediately threw himself

<sup>36</sup> *A.G. Minería*, vol. 48, expediente 7, No. 24.

<sup>37</sup> *Ibid.*, Nos. 1-7.

<sup>38</sup> *A.G. Minería*, vol. 48, expediente 7, No. 52. See below, chap. vii.

<sup>39</sup> Cf. below, chap. vii.



wholeheartedly into his new work and the renaissance of the Tribunal may be said to have begun with Elhuyar's arrival.

Another indication that affairs were returning to a more orderly condition was the fact that in the autumn of 1788 preparations were begun for a *Junta General de Minería*. On September 24th the Viceroy wrote the Tribunal that Don Juan de Santelices Pablo, *consultor* of the Tribunal, had called attention to the fact that the last Junta General had been held in June 1784 and that under the Ordinances it was time for another. As the fiscal and assessor agreed with this view, he instructed the Tribunal to make plans for holding such a gathering in December.<sup>40</sup> The Tribunal objected that the royal order of July 19, 1786 had suspended the Juntas General and hence there was no authority for holding them, but the Viceroy replied on October 13th that the matter had again been referred to the fiscal and assessor and they both agreed that the juntas should be held; therefore he instructed the Tribunal to make the necessary preparations.<sup>41</sup>

Just what measures were taken we do not know, but apparently the Junta General convened sometime in May 1789, with about thirty delegates present. Most of our information about the first meetings of this junta comes from two reports of Elhuyar to Valdés, Minister of the Indies, dated June 26 and July 28, 1789.<sup>42</sup> The first session, devoted to the formalities of credentials, went off smoothly, but on the second day there was disagreement over a proposal of one of the delegates that the Viceroy be asked to suspend for the time being Tit. 1, Art. 3 of the Ordinances in so far as it required ten years' practical experience in mining of all candidates for positions on the Tribunal. The purpose of this was to permit the election of distinguished persons of wealth who might lack the full ten years' experience. In spite of the opposition of Elhuyar, who

<sup>40</sup> *A.G. Minería*, vol. 48, expediente 7, No. 50.

<sup>41</sup> *Ibid.*, No. 62.

<sup>42</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2238, expedientes 5 and 6.

felt that such action would make the Tribunal a second Consulado and would be contrary to the whole conception of the Mining Guild, on May 27th the Junta voted seventeen to twelve to forward the request to the Viceroy Flores. On the following day Elhuyar sent a strong protest to the Viceroy against any such modification of the Ordinances, basing his arguments both on the legal requirements of the Ordinances and on the undesirability of such a modification from a practical point of view.

Flores referred the junta's request and Elhuyar's letter to the fiscal and assessor and the members of the *Junta de Arreglo*. The first two agreed entirely with Elhuyar's arguments, both of law and fact, as did a majority of the *Junta de Arreglo*. The Viceroy followed the majority opinion and on June 9th issued a decree refusing the request and ordering the Junta General to proceed immediately with the elections. On June 16th the Junta met again and decided that the Tribunal should examine the lists of candidates proposed by the *Diputaciones Territoriales* and determine those who had the necessary qualifications. This entailed considerable difficulty as the lists submitted were in very bad order, but by July 2d the Tribunal had completed its task and the Junta reconvened. When the time came for the election of the administrator-general new doubts arose which required further consultation with the Viceroy. These came about because of the requirement of the Ordinances that only persons who had served as deputies-general were eligible for the post of Administrator. Liceaga, Barroso, and Basoco were the only persons available who had been deputies and the last two were neither miners nor had they been elected to their positions. The question was whether the election should go to Liceaga by default, whether all three should be considered, or whether under these circumstances the field should be thrown open to any one otherwise qualified. While this was referred to the Viceroy, the Junta recessed once more. Unfortunately at this point our records of the Junta

General come to an end; but from later evidence it appears that the Junta dragged on at least until the middle of August.<sup>43</sup> Eventually it either broke up of its own accord or was dissolved by the Viceroy without electing a new administrator or deputy-general.<sup>44</sup> The Junta General has been given more attention than its results merit because it was the first regular one which had been held. With twenty-eight delegates present it would appear to have been a representative gathering, but from the vote to suspend the Ordinances one suspects that a good many of the delegates were not actually miners from the provinces but residents of Mexico who had proxies from the *Reales de Minas*. It is significant, too, and an unfavorable augury for the future, that this first Junta General had to adjourn without fulfilling its primary duty. We will return to this and the subsequent triennial Juntas in a later chapter; here we should note that the Tribunal continued for the next few years to be composed of Elhuyar, Liceaga, and Barroso, with one of the *Consultores* filling the vacancy.

We may now return to the reorganization proper which we left at the end of 1787; little progress was made during the years 1788 and 1789. The *Junta de Arreglo* had adjourned in July 1787, to await the completion of Monterde's audit of the Tribunal's accounts. This was accomplished late in 1788 and, on November 25th, Monterde sent his report, together with the accounts, to the fiscal of the Hacienda, Ramón de Posada.<sup>45</sup> The latter examined these documents and made a preliminary report on them to the Viceroy on December 16th, summarizing and approving Monterde's conclusions as to the sums which should be credited and debited to the bank and making certain recommendations concerning them.<sup>46</sup> He urged that where it had not already been begun, action should be taken imme-

<sup>43</sup> Viceroy to Tribunal, Aug. 14, 1789, *A.G. Minería*, vol. 48, f. 254.

<sup>44</sup> Cf. below, pp. 218 ff.

<sup>45</sup> *A.G. Minería*, vol. 63, f. 256.

<sup>46</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2238.*

diately against the various individuals involved to recover the sums which Monterde had adjudged due the bank, and for this purpose the necessary papers should be demanded from the Tribunal. Action concerning the sums found to be due individuals from the bank he believed should be postponed, inasmuch as for the most part they were the same persons who owed money to the bank. He felt that nothing could be done about the sums advanced as avíos until detailed information had been obtained on each individual case and until the Tribunal itself had been heard, all of which he recommended be done immediately. Finally he urged that the Viceroy reconvene the *Junta de Arreglo* and lay all these matters, as well as the accounts themselves, before it.

Little action was taken as a result of this opinion and on January 18, 1789 Posada repeated his requests to the Viceroy that the collection of the sums due the bank be pressed actively.<sup>47</sup> In the meantime he had written Valdés, who had succeeded the Marqués de Sonora as Minister of the Indies, expressing disgust with the whole affair.<sup>48</sup> He praised Monterde's audit, but said that all efforts to safeguard the funds of the bank were viewed with ill will and obstructed by those who had profited from the laxity of the past, and that it was futile to hope for the recovery of sums once misspent. He urged that the King authorize the closing of the files concerning the recovery of the avíos as he felt that there was no hope of getting anything back and the effort was only a waste of time. He recommended further that orders be given for the *Junta de Arreglo* to conclude its studies without further delay, and that until the whole arreglo was settled all financing of mines be absolutely suspended. Finally he requested that the Tribunal be ordered to pay the salary and expenses of Monterde, and that he (Posada) be relieved of any further duties in connection with the *Tribunal de Minería* or its reorganization.

<sup>47</sup> *A.G. Minería*, vol. 63, ff. 15-18.

<sup>48</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2238.

In spite of Posada's recommendations little or nothing was accomplished during 1789.<sup>49</sup> A new *Junta de Arreglo* had been appointed composed of some of the former members, but with the addition of Elhuyar, Gamboa, Monterde, and Valcarcel, but this failed to convene formally. According to Elhuyar virtually the whole year was wasted in reading the various expedientes dealing with Monterde's report and studying the accounts, without any decision being made or any real discussion being held. Since he believed it would take years of study for the junta to accomplish anything worth while, Elhuyar expressed great satisfaction that at the end of 1789 the Viceroy had taken matters in hand and ordered the junta to cease its deliberations and each of its members to prepare a written opinion giving his personal views on the various points. Elhuyar warned that, because of the lack of experience of the members, many of the opinions would not be worth much, but at least they were better than a mere composite vote by a majority of the junta.<sup>50</sup>

The decisive step referred to by Elhuyar had been taken by the vigorous new Viceroy Revillagigedo soon after he took office.<sup>51</sup> At his command the Secretary of the Government drew up a memorandum of the matters concerning the arreglo of the Tribunal on which it was desirable that the junta give its opinion, with instructions that each of the members should submit in writing his views on these topics not later than January 2, 1790. The memorandum was dated November 21, 1789,

<sup>49</sup> There was a royal order which gave Elhuyar more freedom to devote himself to investigation and research of a technical nature. This separated the office of assessor from that of director and said that the latter's primary duty was to promote the technical progress of the mining industry, and that his duties in connection with the Tribunal were not to prevent his making trips to the various mining centers; Valdés to Flores, July 18, 1789, *A.G. Cédulas*, vol. 143, No. 196.

<sup>50</sup> *Informe* of Elhuyar to Valdés, Jan. 14, 1790, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2238.

<sup>51</sup> *Instrucción reservada que el Conde de Revillagigedo dió a su sucesor en el Mando, Marqués de Branciforte* (Mexico, 1831), Sec. 474.

and covered twenty-one points.<sup>52</sup> This document and the replies to it brought to a head all the discussion about the bad management of the Tribunal and its reform, and merit considerable attention.

The first points on this memorandum dealt with the possible desirability of modifying or amplifying some of the Ordinances in order to promote the better organization and functioning of the Tribunal, especially concerning the election, qualifications, and number of ministers of the Tribunal, their salaries, its general expenses and receipts, the custody and disbursement of its funds, *avíos de minas*, and other objects for which the Tribunal was created. Points nine and ten dealt with the School of Mines from the point of view of its current and future expense to the bank. Points eleven and twelve related to the miscellaneous fees and pensions for which the Tribunal was liable. The next paragraph noted the debt incurred by the Tribunal and the annual interest of \$16,450. The succeeding points summarized the estimated expenses and receipts of the Tribunal and asked advice on the amount of income which should be set aside annually to amortize the outstanding obligations of the bank, noting that the continuance of the financing of the "Mina de Agua" would cost \$96,000 per year and thus practically exhaust the income balance after necessary expenses. Points seventeen and eighteen brought up the problem of the financing of mines, summarizing the royal orders of 1786 and 1787, and seeking information on the advisability of appointing one or more expert engineers to inspect mines financed by the Tribunal. The twentieth point asked what course should be followed concerning the nine demands (on the Tribunal) made by the fiscal. Each one of these demands — which were the ones requiring the return of funds held to have been spent without justification — was then summarized. The last paragraph laid squarely before the members of the *Junta de Arreglo* the problem as to what action should

<sup>52</sup> *A.G. Minería*, vol. 156, ff. 259-269.

be taken on the basis of the General Account of the Tribunal and Monterde's audit thereof. This point, of course, overlapped the preceding one as the fiscal's demands were based on the finding of Monterde.

From this outline we get a fairly concise statement of the problems to be solved by the *Junta de Arreglo*. It will be seen that these affected fundamentally the future of the Tribunal and the whole Mining Guild covering, as they did, matters of the organization of the Tribunal itself, qualifications of its members, and the scope of its activities, particularly along financial lines. In the opinions written by the members of the *Junta de Arreglo* — alas, not so concise as the statement of the problems — we get a variety of personal views as to how the questions should be settled from a number of prominent persons both miners and laymen. There were eight written opinions handed in by the required date of January 2, 1790. These were rendered by Gamboa, Regent of the Audiencia and author of the "Commentaries" referred to in Chapter I; Liceaga, the senior deputy of the Tribunal; Elhuyar, the director; Barroso, deputy of the Tribunal and of the Consulado; Lic. José González Castañeda, another prominent lawyer; Don Manuel Ramón de Goya, who has not been identified; Monterde, the auditor of the Tribunal's accounts; and finally by Beleña, the judge of the Audiencia appointed by the Viceroy as acting assessor of the Tribunal. From this list it will be seen that although the lawyers and laymen outnumbered the miners, most of the opinions were written by persons who were thoroughly familiar with the Tribunal and its problems.

The opinion of Francisco Xavier de Gamboa may be described as a thoroughgoing criticism of the Tribunal and all its works.<sup>53</sup> He believed that measures of reform would be futile, that the Tribunal should be discontinued, and the whole plan redrawn. With the exhaustion of its funds for financing mines, he said the principal object of the Tribunal had ceased,

<sup>53</sup> A.G. *Minería*, vol. 156, ff. 269-287.

and that litigation could be better handled as formerly by the civil courts. Similarly, he thought that the School of Mines was quite unnecessary and would be only a useless expense. In his opinion the income of the Mining Fund should be used to pay off the debt of the bank and then be allowed to accumulate for future financing. But he emphasized that such financing in the future must be carried on under a very different system from that followed thus far, and recommended some such plan as that suggested in his *Commentaries*. He would have put the Tribunal under the Consulado, leaving it as little more than an advisory body, with all real authority over finances in the hands of the latter, and jurisdiction over mining cases returned to the civil courts. One further suggestion was that instead of financing a few mines the Mining Fund be used for the benefit of the whole *Cuerpo de Minería* by the centralized purchasing of quicksilver and other mine supplies.

In view of his unfavorable opinion of the Tribunal, Gamboa took a surprising stand on the question of the charges brought by Posada against its former members, recommending that they be dismissed. He justified this view by saying that in many cases it would be impossible to collect the money, and in others the expenditure, while perhaps irregular, was really justified. Furthermore, he made the pertinent comment that the money belonged to the miners, and that thus far no member of the Mining Guild had complained as to the expenditure of its funds by the Tribunal. It is disappointing that this able and well-informed official devoted so much of his opinion to destructive criticism and was so obviously piqued that his advice had not been followed in the formation of the Ordinances.

The next opinion is that of Ramón Luis de Liceaga, deputy general of the *Tribunal de Minería*.<sup>54</sup> As might be expected from one who had been a member of the Tribunal during the period under criticism, this opinion was diametrically opposed to that of Gamboa. In fact, Liceaga began his report by saying

<sup>54</sup> *A.G. Minería*, vol. 156, ff. 306-317.



that his opinion must in a sense be an attempt to justify the memory of the other members of the Tribunal, since of those who were active during the period from 1777 to 1786 he was the only survivor. His whole opinion may be summarized by saying that he was opposed to any change in the organization or functions of the Tribunal. He believed that its personnel and authority should be continued according to the provisions of the Ordinances and that there should be no change in the method of financing mines, which he defended as sound in spite of the apparent failures to date.

On the last two points of the outline, which raised the question as to what should be done about the various charges brought by the fiscal on the basis of Monterde's investigations, Liceaga agreed with Gamboa, stating that all the charges should be dismissed. His excuse for this was the firm belief that all the payments which Monterde classified as irregular were thoroughly justified by the circumstances. He closed his opinion with a general criticism of Monterde and his unfairness to the Tribunal and a renewal of his recommendation that the audit and report be turned over to a tribunal composed of miners who had had no connection with the *avíos* granted, which would be able to take informed and disinterested action.

Liceaga also presented a supplementary report, entirely devoted to a defense of the Tribunal's handling of the funds under its control and an attempt to prove prejudice on the part of those who brought the charges of mismanagement before the King.<sup>55</sup> Inasmuch as this repeated substantially the same arguments advanced by the Tribunal's attorney in Madrid in 1787, it need not detain us.

We come next to the report of Elhuyar,<sup>56</sup> which is in many ways the most valuable of all. He was in a strong position to give an intelligent and dispassionate opinion. Devoted to the mining industry and the promotion of its interests, he had not

<sup>55</sup> *Op. cit.*, ff. 318-327.

<sup>56</sup> *A.G. Minería*, vol. 156, ff. 328-380.

been a member of the Tribunal during the early years, and hence was able to criticize its activities with sympathy but without self-interest. Furthermore, he brought to his task experience of the systems and methods practiced in Europe, to all of which he added a careful study of the records of the Tribunal and Monterde's audit, as well as personal investigation of conditions in several of the more important mining centers.

Elhuyar began his opinion with a lengthy introduction discussing the history of the Tribunal and the *arreglo* and pointed out that the former had only exercised its full powers for a little over a year — from the promulgation of the Ordinances until the early part of 1786. He felt that the subsequent reduction of the Tribunal's authority had caused grave prejudice to the miners of the country; and hence that it was desirable to determine the future course promptly. He prefaced his opinion further by stating that he deemed it improper for the junta to make any decision regarding the charges made against the former members of the Tribunal, as there had been no opportunity for them to present their defense. Furthermore, he believed that the junta should devote itself to the reform of the Tribunal and not of the Ordinances, saying that the latter could be done later by the Tribunal itself after mature reflection and consultation with the provincial deputations.

Elhuyar's opinion was divided into two parts, the first dealing with the existing state of the Tribunal and the measures which might be taken to improve it without altering the fundamental structure, and second the underlying defects which appeared in its constitution and possible modifications to remedy them.

He recommended that the Tribunal be continued as provided for in the Ordinances and that the qualifications for membership stipulated therein be strictly adhered to. The only change he suggested was that the office of fiscal be permanently separated from that of director and combined with that of

*Contador* — a new office which should keep a continual check on the accounts of the Tribunal to avoid a repetition of the irregularities of the past. He also believed that the Juntas General should be subordinate to the Tribunal and should limit themselves to their proper functions of electing the members of the Tribunal and discussing problems of general interest to the industry. This recommendation was undoubtedly provoked by his experience with the Junta General held during the summer of 1789.

Elhuyar then turned to a discussion of the various expenses of the Mining Guild. He stated that in general the two primary functions of the mining fund were to provide adequate support for the Tribunal and the School of Mines as the two best instruments for promoting the interests of the mining industry. The former he had already discussed, while his recommendations for the School were embodied in the separate "Plan" recently drawn up.<sup>57</sup> In commenting on possible savings which could be effected in the expenses of the Tribunal, he felt that the fees paid to the officials of the Mint could be greatly reduced and that the annual contribution of \$5000 to the Academy of San Carlos should be discontinued entirely. He urged that the various pensions for which the Tribunal was obligated be terminated as soon as possible, and that when funds were available the \$329,000 debt be paid off so as to save interest. He suggested that future "extraordinary expenses" be considered very carefully, and that when the sum under consideration exceeded \$3000, the Tribunal should not decide itself but call in the four consultores resident in Mexico and any former members of the Tribunal to act as a junta to pass on the expenditure.

In spite of the poor results obtained thus far, Elhuyar believed the financing of mines was still a proper investment for the mining fund. He said it was not fair to form a final judgment from the mistakes of the past as, if more funds had been

<sup>57</sup> See below, chap vii.

available to continue aid to the hopeful mines, the story might have been different. He believed, however, that as a general rule the bank should not advance funds to individual miners, except in cases of grave emergency. Rather, Elhuyar recommended that the bank finance public works which would benefit all the miners of a given section instead of just a few individuals, such as drainage tunnels for a whole district, roads, supplies of potable water, and reforestation. He said that wherever possible only a portion of the cost of a given project should be borne by the Tribunal, as much as possible being put up by local interests, so that the funds of the bank could be used to serve as many regions as possible. Particularly at first, the bank should proceed slowly and with great caution, gradually developing an efficient technique. Full information should be obtained on every project and a thorough investigation made by the director, and the final decision made only by a full junta of all the ministers and consultores of the Tribunal. One salutary result which he believed would spring from this policy, would be a closer coöperation between the provincial deputations and the Tribunal and a greater unity of the whole Mining Guild.

In the second part of his report, Elhuyar discussed certain more fundamental changes which he believed should be made in the constitution of the Tribunal and Mining Guild if they were really to function efficiently. Most of this discussion involved changes in the judicial aspects of the organization of the Guild. He pointed out that while the Tribunal had authority over the provincial deputations in administrative and economic matters, this was not so in cases of contentious jurisdiction. In this sphere the provincial deputations were independent except for appeals to the *Juzgados de Alzadas*. He criticized severely both these units in the judicial system, charging that their weakness was due mainly to the ignorance or general unfitness of the personnel for the positions involved and also to the lack of uniformity arising from so many inde-

pendent jurisdictions. Elhuyar also expressed an unfavorable opinion of the personnel of the Tribunal itself. He stated that it should be composed of the best men available but that the existing system of election did not accomplish this purpose, since the choice was between prosperous miners who had not the time to give to the Tribunal and unsuccessful ones who were of no value to it.

He believed that these problems could be solved and the organization of the Guild put on a solid foundation only through the establishment of the provincial administration on a career basis. In order to carry out this scheme, he suggested the following plan. The reales de minas of the country should be divided into two classes, the first consisting of the important centers such as Guanajuato and Zacatecas, and the second of those of lesser importance. For each the Tribunal should appoint a well-qualified person as *juez*, or *administrador de minas*. This person would exercise all the functions of the existing territorial deputations and would be directly subordinate and responsible to the Tribunal in all matters. In the reales of the first class, there should also be appointed a *perito facultativo* to assist the judge and act for him during his necessary absences. For the present, the administrators should be chosen from among the best qualified persons in the kingdom, but not the peritos, whose positions should be reserved for graduates of the School of Mines. He hoped that all the positions would in time be filled by the latter — starting as peritos and working up to administrators of the second class, then of the first class, with the best being finally chosen to fill vacancies on the Tribunal. This system, he believed, would result in a vigorous and disinterested administration of all the affairs of the Mining Guild, and would permit the Tribunal to assume the importance originally intended for it.

Under the proposed system, the functions and duties of the *jueces territoriales* would be the same as those of the existing deputies, with jurisdiction in the first instance over all con-

tentious cases, and administrative and economic powers as laid down in the Ordinances — all subject to the Tribunal. The latter would also continue to exercise the same administrative and economic powers, but in judicial affairs it would serve simply as a court of appeal, leaving all litigation to the *jueces territoriales* in first instance. Elhuyar said that while in many ways it would be desirable to have all appeals go to the Tribunal, this would be an inconvenience; hence, he recommended a second court of appeals in Guadalajara and suggested that this might in time develop into a second *Tribunal de Minería* for the northern provinces, but always subject to the Tribunal in Mexico. The existing *Juzgado de Alzadas* in Mexico could continue as a court to hear appeals from the Tribunal.

This report of Elhuyar's has been described at greater length than the others because it was more objective and offered more thoughtful criticism of the whole institution. While the fundamental changes which he suggested were never put into effect, some of his recommendations were, particularly the last one, making the Tribunal a general court of appeals. It is also well to bear these suggestions in mind as we study the later history of the organization; this might have been more successful if his ideas had been adopted. At all events, as we shall see below, twenty-five years' experience served only to confirm his opinion in his own mind.

The next report to come before us is that of Don Antonio Barroso.<sup>58</sup> Barroso believed that the Tribunal should continue to have three deputies-general as provided in the Ordinances, but thought that two of them should always be merchants. He said that merchants were better qualified than miners to run financial affairs and would save the bank considerable losses, as well as give the public greater confidence; while the other members would supply all the technical knowledge of mining that was necessary. Like Elhuyar, Barroso criticized the provincial deputations and favored a greater centralization of

<sup>58</sup> *A.G. Minería*, vol. 156, ff. 382-414.

authority in the hands of the Tribunal itself, but did not advocate much limitation on the latter's faculties or independence. Thus he opposed requiring the Tribunal to submit its accounts to the *Tribunal de Cuentas*; instead he favored an audit by two members of that body who should submit their report to the Junta General. Barroso agreed with Elhuyar that Monterde's audit and the demands of Posada should be referred to the Tribunal for final action and determination. He recommended that there be no further financing of mines until the existing debt had been retired, and that when it was renewed each application should be investigated by the director, or some specially appointed engineer, and voted on by a junta of the Tribunal and consultores. It will be seen that while Barroso favored giving merchants a considerable voice in the management of mining affairs and adopting some of the practices of the Consulado, he did believe the Tribunal should continue as an essentially independent body with broad powers over the industry and did not favor its subjugation to the Consulado as urged by Gamboa. This, from a merchant who had had an opportunity to see at first hand all the weaknesses of the Tribunal, is significant evidence that in spite of its faults, the Tribunal filled a real need in the country.

The report of José González Castañeda was of a very different nature, reminding one of that of the other lawyer, Gamboa.<sup>59</sup> He claimed that with an annual income of \$150,000 it would take the Mining Guild ten years to pay off its existing debt and accumulate enough capital to make the resumption of mine-financing worth while. In the meantime, he said the Tribunal could serve no useful purpose and hence recommended that it be suspended entirely for this period, keeping only the director. The provincial deputations could handle all judicial business with appeals being taken to the audiencias — a system which he believed vastly superior to the existing one anyway and which should continue even after the Tribunal was re-

<sup>59</sup> *A.G. Minería*, vol. 156, ff. 415-426.

established. Likewise, he viewed the establishment of the College with disfavor, proposing instead the endowment of eight students in the University and one professor of mining, to be assisted by some of the professors from the Academy of San Carlos. He suggested that when \$1,000,000 had been accumulated the Tribunal be reestablished to administer the fund — but that it should be composed of a director and four deputies-general, of whom two would be merchants. He also recommended the election of six consultores consisting of two miners, two private *aviadores*, and two lawyers, to vote with the Tribunal on the financing of mines. He suggested that half of the \$1,000,000 capital be used for *avíos*, and the remaining part for projects of more general benefit to the industry — such as the purchase in Spain of tools and machinery for sale to miners at cost, emergency aid to distressed districts, and assistance in the distribution of quicksilver. He favored continuance of the various pensions and gratifications paid by the Mining Guild, even though the Tribunal be temporarily suppressed, and was not much interested in what should be done about the demands of the fiscal.

The opinion rendered by Manuel Ramón de Goya was as sympathetic to the Tribunal as the preceding one was opposed to it.<sup>60</sup> He believed the Ordinances fundamentally sound, with possible small alterations, and thought that all the members of the Tribunal should be miners, with the modification that, by a two-thirds vote, the Junta General could elect one with less than ten years' experience, but of outstanding ability. He also favored modification of Tit. I, Art. 8 so that a person who had not been a deputy could be elected administrator if he possessed the requisite qualities. Goya recommended that, for the present, there be two deputies, and in addition two *adjuntos* who would have the duty of investigating mines being considered for financing and who, when not so engaged, should attend the sessions of the Tribunal. He was a firm believer in the

<sup>60</sup> *A.G. Mineria*, vol. 155, ff. 100-136.



principle of the School of Mines and urged its prompt inauguration.

Goya then turned to the question of mine financing and, before discussing the future, presented a long and careful defense of the past handling of this activity. He praised the Tribunal for using income rather than borrowed capital with resultant interest charges, and pointed out that an attempt was made to borrow for this purpose only after its income was exhausted. While admitting that there might have been individual instances of unwise expenditure, Goya claimed that those who prevented the Tribunal from borrowing additional funds to carry the development work through to a conclusion were the ones responsible for the loss. As to the future, he believed that the funds of the Mining Guild should continue to be used for this purpose. In his opinion the Tribunal should continue to administer the Fund, with the change that when voting on a grant of avíos, it should call in one of the adjuntos proposed above and four consultores, together with any former deputies or administrators resident in Mexico. He opposed an audit by the *Tribunal de Cuentas* but favored the presentation of the Tribunal's accounts to the Juntas General, saying that the former could only check actual figures, while the latter would have the knowledge to determine the justification for any particular expenditure in a given district or for a given object.

Goya considered well founded the fiscal's demand that the ministers or their heirs make good the shortage in the accounts of the factor Barrio but felt that the other expenditures had been in the interests of the Mining Guild. This report is of interest as coming from an outsider who defended the Tribunal, although not blindly as did Liceaga. He saw some weaknesses and offered suggestions for correcting them, but in general urged continuation of the Tribunal with very little change in composition and practically undiminished powers.

The last two opinions are those of Monterde, the auditor who examined all the accounts of the Tribunal, and Beleña,

the Judge of the Audiencia who was appointed assessor of the Tribunal by the King in 1786. Thus, while both of these men were in a sense laymen and had no practical knowledge of mining, they had both had an opportunity to gain extensive firsthand knowledge of the workings of the Tribunal.

At the beginning of his report,<sup>61</sup> Monterde pointed out that his opinion on most of the questions involved had already been expressed in the audit and supplementary opinion rendered the fiscal of the Hacienda. He did, however, recommend a number of changes in the Ordinances and in the practices of the Tribunal. He favored a body of three, the senior deputy to discharge the duties of the administrator, and urged a more active role for the consultores than in the past. He believed that the provisions of the Ordinances concerning the qualifications of the ministers should be enforced and that \$3000 per year was sufficient salary. Monterde agreed with Elhuyar on the advisability of establishing the office of contador and combining this with the fiscal, and on the importance of the prompt establishment of the School of Mines. He also thought the fees paid the officials of the Mint for collecting the tax on silver should continue, but that the burden of the other pensions for which the Tribunal was obligated should be explained to the King with the hope that he might be inclined to suspend them. Monterde recommended that the estimated surplus of income over regular expense of \$71,786 be devoted to the retirement of debt, and that all financing of mines be suspended until a fund of at least \$300,000 had been accumulated. When that time should come he suggested that, instead of advancing money on the premium basis followed hitherto, the bank make regular time loans to miners on the security not only of the mine but all the borrower's goods, insisting that this method would be better not only for the bank but the miners themselves. In regard to the sums owed the bank by the twenty-one enterprises already aided, he recommended that a careful in-

<sup>61</sup> *A.G. Minería*, vol. 155, ff. 137-150.

vestigation be made of the way in which each appropriation was expended, and, where it was legitimately invested in the mine, the mine be held responsible for its repayment; but in other cases action for recovery be taken directly against the borrower and his goods. On the other points, he expressed the opinion that the demands of the fiscal should be turned over directly to the Superior Government for determination and action, while the *Junta de Arreglo* itself should act immediately on the recommendations made in his report and, where necessary, proceed against Liceaga and the heirs of the other members of the Tribunal for the collection of the sums for which he held them responsible. He also said that the *Tribunal de Cuentas* should not take over the supervision of the mining accounts until the arreglo had been completed.

After what we have seen of Monterde's audit, we would expect him to recommend fairly sweeping changes. The surprising thing is that this report is so moderate. Certain modifications are suggested but the essentials of the Tribunal remain, including the election of its ministers, the requirement that they be miners, and the general scope of its powers and activities.

The last report before us is that of Don Eusebio Bentura Beleña.<sup>62</sup> As might be expected, his opinion was rather legalistic. The first part of his report was devoted to the subject of avíos. He criticized the system under which they had been administered in the past and recommended substantial changes for the future, urging that money be loaned only on collateral security at 3 per cent interest and never in an amount greater than \$10,000 to one person. Furthermore, only moderate-sized mines actually producing ore should be considered, and each application should be finally passed on by the Superior Government after a thorough investigation by the Tribunal and experts appointed by the latter.

Turning to the Tribunal itself, he proposed that there be

<sup>62</sup> *A.G. Minería*, vol. 155, ff. 213-243.

only two deputies with a salary of \$3000 each, and recommended that only one of them be a miner. He favored appointment of the fiscal and assessor by the Viceroy, the latter from among the members of the audiencia. With these changes, he estimated that the Tribunal would have an annual surplus of \$96,000, and suggested that this be divided between avíos and debt-retirement. He also felt that the right of the Tribunal to borrow capital should be abolished or at least suspended until it was free of debt.

His last topic was the modification of the *Ordenanzas de Minería* and this he went into in considerable detail. Many of the changes he suggested were mere clarifications, while others were aimed to give effect to his earlier suggestions. It is unnecessary to describe them in detail as they were never adopted. The most fundamental change suggested was that the Juntas General be abolished entirely and the ministers of the Tribunal be appointed by the Viceroy after consultation with the Tribunal and provincial Deputations. Beleña concluded his opinion by reviewing the importance of the mining industry and pointing out that the real object of the *Junta de Arreglo* was to assist its future. With this in mind, he recommended reduction of the price of quicksilver and powder, and lower taxes on silver refined by smelting. He recalled the benefits which had resulted from similar reductions in the past and pointed out the advantages which would redound to the country and the Royal Treasury from an increase in the production of silver.

Although these opinions have been condensed from the 473 pages which they occupy in the original manuscript, they have been deemed worthy of considerable space in this narrative for a number of reasons. In the first place, it will be useful to bear the various suggestions and arguments in mind when we come to the definitive arreglo promulgated by the King in 1793. Taken together, these opinions present the judgment of a diverse but remarkably well-qualified group of men at a

critical period in the history of the Tribunal. Furthermore, although there is great divergence on details, we can trace certain general ideas through a number of opinions. Except for the two lawyers, Gamboa and Castañeda, neither of whom had had any personal connection with the Tribunal and who favored its complete suspension, all the men accepted the Tribunal as a permanent and useful institution which, with major or minor modifications, should continue to discharge the functions laid down in the Ordinances. There was a fairly general criticism of the provincial deputations, particularly from the judicial point of view, with Elhuyar and Barroso favoring a more centralized form of administration, while Beleña and Gamboa believed that appeals should be taken to the audiencia as before 1783. In regard to the future handling of avíos, there was also remarkable agreement in principle. It was generally felt that this activity should be discontinued until the debts of the bank had been paid off and a substantial surplus accumulated. In spite of the past failures, the majority felt that in one form or another the principle of financial aid to miners should be continued. There was general support for a change in the system of financing which would give the bank greater security for its loans, together with the feeling that the Tribunal itself should not make the final decision on what applications to approve; some favored a junta of Tribunal and consultores, some an even larger body, and some would have given the final decision to the Superior Government. In this connection, there was also the suggestion put forward by several that, instead of limiting itself to aiding a few miners with capital, the Tribunal should expend at least a part of its funds for the benefit of a greater number through the undertaking of public works, centralized purchasing of supplies, or similar activities. Also, in connection with the avíos, there was a disposition on the part of several who had not been on the Tribunal at the time to acquit the latter of the major part of the blame for the failure of the projects undertaken — putting a share of it at any rate on

the government for borrowing so much money from the Tribunal and preventing the latter from raising further capital. At least half of the writers opposed giving the *Tribunal de Cuentas* the right to audit the mining accounts, notwithstanding the irregularity in these in the past. Except for the irreconcilables, Gamboa and Castañeda, there was a unanimous belief that the School should be started soon and that it would play a very useful part in the industry. To generalize, we may say that in spite of its checkered career to date, a large majority of those giving opinions believed fully in the usefulness of the Tribunal and the benefits which would inure to the mining industry and the country as a whole from its continued existence.

Bearing in mind the views set forth in the foregoing opinions, we may now return to the arreglo itself and trace its course to the final decisions. If we were not already familiar with the slow progress of this reorganization, we might expect that, once these opinions had been handed in, the junta would have proceeded forthwith to take definitive action; such, however, was not the case. Again, most of our information on its progress comes from Elhuyar, and his reports show a continuation of the same delays. On January 14, 1790, Elhuyar wrote the Minister of the Indies enclosing a copy of the questionnaire which had been prepared for the members of the junta, together with his own opinion.<sup>63</sup> Because of the complexity of the subject and the fact that it was hard for persons who were not miners to understand all the problems, he warned against accepting the opinion of a numerical majority on any given point, but on the other hand said very definitely that much of value could be gained from a qualitative synthesis of all the opinions. From further correspondence of Elhuyar during 1790, it is clear that the *Junta de Arreglo* continued to meet in a desultory manner without making any real progress.<sup>64</sup>

<sup>63</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2238, expediente 23.*

<sup>64</sup> "Extracto" of a letter of Elhuyar to Valdés, Jan. 27, 1790, *A.I., Sec. 5, Aud. de Méx., Leg. 2242. Elhuyar to Valdés, Apr. 14, 1790, ibid.*

At the end of the year 1790 Revillagigedo became impatient with the lack of progress and took matters into his own hands. After studying the written opinions of the members of the junta, on December 22d he drew up a memorandum which was in effect a qualificative synthesis of all the opinions, such as Elhuyar had advised would be necessary.<sup>65</sup> Revillagigedo recommended that the composition of the Tribunal remain the same as in the Ordinances, but that the salaries of the administrator and director be fixed at \$5000 and \$4000 respectively, and that more latitude be permitted in the choice of the members of the Tribunal. The Viceroy adopted Elhuyar's suggestion that the Tribunal act as a court of appeals from the provincial deputations and that the latter be subordinated to the former in judicial as in administrative matters. He did not go as far as the director in suggesting that the Tribunal appoint the provincial deputies, or administrators, nor did he think it necessary to have a second court of appeals in Guadalajara.

Revillagigedo thought the establishment of the School necessary and desirable, but urged that the King allow a reduction of the special pensions and fees paid by the Tribunal; if this were done he estimated that the Tribunal would have an annual surplus of \$66,461 and recommended that this be used to retire its debt.

On the subject of avíos, Revillagigedo reached an original conclusion which drew on the ideas of several of the members of the *Junta de Arreglo*. He suggested that after the debt had been paid off the Tribunal and the Consulado form a joint company to own and operate mines directly as would any other company, each body putting up \$500,000. This suggestion was clearly influenced by Gamboa, but lacked his contempt for the Tribunal. The Viceroy argued further that in a few years the

<sup>65</sup> The memorandum itself is missing but there is a full summary of it in a dispatch from Revillagigedo to the Ministry dated Jan. 13, 1791, A.G. *Virreyes*, Ser. I, vol. 30, No. 33.

\$500,000 which the Tribunal invested would be increased by its annual surplus income and the return on the capital already invested, and that this could then be used for the habilitation of other worth-while mines in accordance with the original purposes of the fund; however, no grants of avíos should be made without a thorough investigation by the Director and the approval of the Superior Government. He recommended further that the Tribunal be required to include a financial statement in its annual report to the King and that its accounts be audited annually by the *Tribunal de Cuentas*. Rather surprisingly he urged that the demands of the fiscal be dismissed and that the King absolve the former ministers or their heirs from responsibility, as he considered most of the extraordinary expenses justified.

It is significant that this Viceroy — one of the outstanding ones of the century — who had arrived in New Spain at a time when the Tribunal was in such great disrepute should have been sufficiently impressed with its usefulness to urge its continuance with relatively minor changes. While he recommended considerable curtailment of its powers to finance mines, he advised that its judicial powers be enlarged. This is particularly interesting as in general Revillagigedo opposed exemption of various privileged bodies from the ordinary jurisdiction.<sup>66</sup>

The course of the arreglo now turns back to Spain, where the various reports we have been studying gradually ran their course through the official mill and resulted finally in a royal cedula of February 5, 1793, which was the definitive order regarding the reorganization of the Tribunal. On June 6, 1791, the Marqués de Herrera submitted his recommendations as to the reorganization.<sup>67</sup> His report was based directly on the above dispatch of Revillagigedo, but he also had before him the opinions of the members of the junta which he obviously had studied carefully. Herrera agreed with Revillagigedo that

<sup>66</sup> Revillagigedo, *Instrucción reservada* . . . , Sec. 92.

<sup>67</sup> *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2238, expediente 34.



the composition of the Tribunal should remain the same as provided in the Ordinances, and also with the latter's suggestions for salaries and the permanent separation of the offices of fiscal and director. He opposed, however, any change in Tit. I, Art. 3 which required the ministers to be experienced miners, on this point agreeing entirely with Elhuyar. Again, following the Viceroy's opinion concerning contentious jurisdiction, Herrera recommended that the Tribunal act as a court of appeals for the whole district of the Audiencia of Mexico, leaving original jurisdiction to the *Diputaciones de Minería*. Herrera approved Revillagigedo's comments on expenses, the inauguration of the School of Mines, and the elimination of some of the pensions and special contributions for which the Tribunal was obligated. On the subject of the handling of the funds of the Tribunal and *avíos de minas*, Herrera disapproved wholeheartedly of the Viceroy's recommendations and more nearly approached the views of Elhuyar. He recommended that the surplus income, whether large or small, be left entirely at the disposition of the Mining Guild in accordance with Tit. 15, and Tit. 16, Art. 2 of the Ordinances, and quoted this latter article with full approval.<sup>68</sup> Contrary to the opinion of the Viceroy, Herrera also opposed the submission of the accounts of the Tribunal to the *Tribunal de Cuentas* for revision and approval. He agreed with Revillagigedo, however, in regard to dismissal of the demands of the fiscal.

Herrera concluded his report with an earnest plea on behalf of the mining industry, stressing its supreme importance to the nation as a whole and the desirability of royal favor being shown it. He pointed out the increased production resulting from the lowering of the price of quicksilver and, as he claimed, from the establishment of the Tribunal; and included a sen-

<sup>68</sup> "La administración, cobro, y custodia de los caudales que de esta manera se colectaren, han de hacerse y estar siempre al arbitrio y disposición del enunciado importante *Cuerpo de Minería*, a quien pertenece, por medio de su Real Tribunal General de México que lo representa."

tence of significance in any attempt to assess the value of the Tribunal, saying, "On this basis, I do not think it rash to assume that part of the falling off in the extraction of silver and gold in New Spain, and its coinage, from the year 1786 until that just ended of 1790, has sprung from the disorder, obstruction, and lack of authority of the *Tribunal de Minería*, and in the circulation of its funds, because of this file (i.e., the whole subject of the arreglo) and the charges which were made as to its conduct, which almost destroyed its very foundations . . ."

As this long story of the reorganization approaches its final phase, it is most interesting to see the swing back to the view that the Tribunal should not be deprived of its powers. At first scarcely a good word could be said for its management of affairs. But here we have seen the Viceroy present recommendations that would only limit its authority to a slight degree and the Marqués de Herrera go even further and disapprove a number of the modifications which Revillagigedo suggested. Along one line at least, Herrera's program gave the Tribunal more authority than it had enjoyed heretofore, by empowering it to hear appeals from the provincial deputations. It may well be asked, whence this change from attack to sympathy and support? Was it simply the passage of time which made the sins of the past seem less important? Possibly, but it should be remembered that both the Viceroy and Herrera had before them the opinions of Gamboa and Castañeda, which were recent and most bitter against the Tribunal. It seems more probable that both of these officials, being more removed from local and personal passions, were able to take a more objective view of the situation. It might be argued that, being government bureaucrats and not closely identified with Mexican problems, they preferred simply to fall back on the traditional Spanish policy of no change. But Revillagigedo was an able, outspoken, and vigorous administrator, had made a careful study of the situation, and presented a well-thought-out

opinion. The same may be said of Herrera, who, although he was three thousand miles from the scene, knew whereof he spoke by virtue of twenty-two years' official service in America, including wide experience in Guanajuato and other *Reales de Minas* in Mexico. These two opinions, which led directly to the final determination of the problem, are then of double importance and significance. They indicate, first, that in spite of its relatively brief independent existence and the mistakes which it had made, the Tribunal had proved its value at least enough to cause these two high officials to urge its continuation with virtually undiminished powers and independence; and, second, they spoke highly of the ability and calm judgment of two men high in the Spanish colonial administration, who were able to untangle the web of passion and partisan prejudice and render an objective report. The fact that these two reports do not entirely agree only makes each of greater value.

Although the ground was now ready for the final decision on this reorganization, and as finally promulgated it followed closely Herrera's ideas, the definitive pronouncement was not forthcoming for over a year and a half. No new influences went into the final decision, but the file had to be cleared through the *Direccion de la Real Hacienda de Indias* and passed to the various members of the Royal Council.<sup>69</sup>

On January 25, 1793, the *Direccion de la Real Hacienda de Indias* returned the arreglo file with its opinion, which agreed

<sup>69</sup> There are two documents belonging in this interim, which, while they had no effect on the final result, throw some interesting side lights on the situation in Mexico. A representation from the "*Apoderado en Madrid de la Minería de Guanajuato*," dated Sept. 30, 1792 (*A.I., Sec. 5<sup>a</sup>, Aud. de Méx., Leg. 2238, Doc. 67*), gave the views of that important mining center on the arreglo and is noteworthy for the bitter feeling manifested toward the Tribunal. It opposed vehemently any changes which would give the Tribunal greater authority over the provincial deputations, and objected to the efforts of the director to introduce new mining techniques. About the same time the Tribunal sent a dispatch complaining of the delay in concluding the arreglo, and objecting particularly to the inconveniences arising from the vacancies in the Tribunal and from its having an assessor responsible to the Viceroy and who was a member of the Audiencia. (*A.I., Sec. 5<sup>a</sup>, Aud. de Méx., Leg. 2243, Doc. 10.*)

with that of Herrera on all points except the possible reduction of the pension to the heirs of the Marqués de Sonora; this it did not approve.<sup>70</sup> A meeting of the Council of State was held on February 5th, to go over the whole matter and make the final decision.<sup>71</sup> At this council there were present, besides the King, the following Ministers of State: Aranda, Decano Valdes, Campo de Alange, Gardoqui, Alcudia, and Acuña. The previous history of the arreglo was explained briefly to the Council, with particular mention of the Viceroy's report and its reference to Herrera and the Hacienda. Gardoqui then laid the file before the Council, and after consideration the King made his decision, which was that the opinion of Herrera should be ratified except on three points. The first involved the School, and made only a slight change which covered the furnishing of needed instruments and equipment by the Ministry of the Indies. The second provided that, contrary to the opinion of the Viceroy and Herrera, there should be no change for the present in the pension paid the Academy of San Carlos, as the King considered that even miners could get some benefit from the study of drawing and the principles of architecture. The third point involved the pension to the heirs of Gálvez; on this the King made no decision "because no interested party made any claims."

Out of this Council came the very important Royal Cedula of February 5, 1793.<sup>72</sup> All of the points in this have already been discussed at such great length (even the Cedula speaks of "este difuso expediente") that we need only summarize the final decision of the King, which, as has been said, in almost all cases was in accord with the view of Herrera. The Cedula contains twenty paragraphs, the first two of which are simply declaratory of its purpose; the others follow:

<sup>70</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2238.*

<sup>71</sup> *Ibid.*

<sup>72</sup> *A.G., Reales Cédulas*, vol. 154, No. 105; this order is included as an amendment to the Ordinances in some editions thereof.

3. The composition of the Tribunal should remain unaltered and follow strictly Art. 2, Tit. 1 of the Ordinances.

4. The office of fiscal should continue separate from that of the director according to the royal orders of February 7, and May 10, 1791.

5. The employment by the Tribunal of an assessor, factor, secretary, two clerks and two porters was approved; nothing was said as to how the assessor should be chosen, but it was ordered that this official should be present at the Tribunal every day — which would seem to eliminate a judge of the audiencia.

6. The salaries of the various officials were fixed as follows: The administrator — \$5,000; the director and four deputies — \$4,000 each; the factor, \$2,500; the secretary — \$1,200; the chief clerk — \$1,000; the second clerk — \$600; the first porter — \$400; and the second porter — \$300; the assessor — \$2,500 with a prohibition against taking any fees.

7. Art. 3, Tit. 1, of the Ordinances — requiring ten years practical mining experience for the Ministers of the Tribunal — should be strictly adhered to.

8. Likewise Art. 7, Tit. 1 — concerning the number of votes of each *real* in the *Juntas Generales* — should remain in force.

9. Title 3, concerning contentious jurisdiction was modified so that mining disputes would be heard in first instance by "*el Juez Territorial, Juez de Minas, y los Intendentes donde los hubiese*" sitting with the *Diputación Territorial*; appeals to go to the *Tribunal de Minería* and thence to the *Juzgado de Alzadas* of Mexico for the territory of Audiencia of Mexico, and to the *Juzgado de Alzadas* of Guadalajara for that district.

10. Approval of certain minor regular expenses of the Tribunal.

11. Approval of a budget of \$25,000 for the School of Mines and expression of the wish that it might be opened as soon as possible with the necessary equipment and supplies.

12. In regard to the reduction of certain of the outside obligations of the Tribunal, disapproval of any change for the present in the contribution to the Academy of San Carlos or the pension to the heirs of Gálvez, but approval of a reduction of the fees paid the officials of the Mint in accordance with the recommendations of the Viceroy.

15. Concerning the handling of the *Fondo Dotal*: this paragraph provided that the surplus income of the Tribunal should remain entirely at the disposition of the Tribunal in conformity with Tit. 15

and Tit. 16 of the Ordinances, provided that no mine could be financed without the approval of all the ministers and *consultores* and on the recommendation of the director and fiscal, and that preference should be given to the mines and undertakings most worthy of attention. While it was stated that the Tribunal should render annual reports to the viceroy, it was pointed out that the money belonged to the miners and that it would be unjust to limit their control over it; hence, the viceroy was particularly forbidden to intervene in the granting of *avíos* or take any action which might embarrass the Tribunal or serve to delay the discharge of its proper functions.

16. Disapproval of the viceroy's idea of the formation of a joint "*Compañía de Avíos*" by the Tribunal and the Consulado.

17. Concerning the custody of the funds of the Tribunal: provision that Art. 6, Tit. 16, be adhered to and in addition that the fiscal be present at the deposit and withdrawal of all funds and that the secretary pay no draft without the signatures of the ministers of the Tribunal signifying the latter's approval.

18. Approval of the viceroy's recommendations in regard to the demands of the fiscal of the Hacienda on the subject of responsibility for certain of the extraordinary expenses incurred by the Tribunal, and specific approval of the gratifications paid Mayorga and Velásquez with consequent release of the ministers authorizing these from any responsibility.

19. Refusal of the request of some persons to amplify or amend the Ordinances, as the *Junta de Arreglo* was only authorized to consider certain subjects.

20. This final paragraph required that the preceding ones be promptly complied with and considered as additions to the Ordinances, and notice of them be given to the Tribunal and all the *Reales de Minas*. Finally, there was an expression of thanks to the Viceroy for his work as well as to the *Junta de Arreglo*, and the assurance that the King has full confidence in the Tribunal together with the instruction that the latter should proceed forthwith to hold elections for the administrator and other officials necessary to fill its vacancies.

There need be little explanation of this important cedula as the evolution of all the points has been pretty thoroughly considered. The striking thing about it, taken as a whole, is the almost complete vindication of the Tribunal which it em-

bodies. On virtually all of the points in this order, the decision was that the Ordinances should be strictly adhered to and that the composition, qualifications, and functions of the Tribunal should remain the same as prior to the *arreglo*. The separation of the office of fiscal from that of director was made permanent, but this was an improvement favored by the members of the Tribunal themselves. Of all the points, paragraphs 9 and 15 are easily the most important. The first represents a definite enlargement of the powers of the Tribunal by granting it authority to hear appeals from the decisions of the local courts for the whole district of the Audiencia of Mexico. It will be remembered that previously in matters of litigation, the Tribunal had only enjoyed jurisdiction in first instance over the district within fifteen leagues of Mexico. This change not only raised it in dignity from a court of first instance to a court of appeals, but thereby indirectly increased its authority over the provincial deputations. The powers of the latter were at the same time diminished by the provision that the *Juez Real* should join the deputies in cases of first instance.<sup>73</sup> The second important paragraph was the one regarding the handling of the Mining Fund. This confirmed very explicitly the right of the Tribunal to handle its own financial affairs without interference from the Viceroy or any other official of the royal government — and this in spite of the pronounced views of the Viceroy and a number of the members of the *Junta de Arreglo*. Aside from the reasons suggested above, it is more than probable that the influence of Elhuyar was to a great extent responsible for this vindication of the Tribunal. It must be remembered that he was a European appointed by the King and that for this reason his opinion on the Tribunal was relatively objective; yet he consistently advocated the independence of the Tribunal and even an extension of its authority; and, while it did not

<sup>73</sup> This paragraph will be discussed in detail in chapter vi, where it will be shown that it was received with dismay by the *Diputaciones Territoriales*, and in part at least by the Tribunal itself.

go the whole way, the royal order more nearly followed his advice than that of any of the other persons involved in the arreglo.

The reactions to this cedula were varied. It reached the Viceroy on May 25th, and on the 29th he dispatched two letters in reply, acknowledging receipt of the order and reporting that he had transmitted it to the proper authorities.<sup>74</sup> He expressed his pleasure that to such a great extent the order followed the lines of his own opinion, but disapproved heartily of the decision in regard to the handling of avíos and the funds of the Tribunal, foreseeing only disaster if the latter were given full power and discretion as in the past. He begged that the decision on this point might be reviewed and some control given to the royal government. The other point on which he raised a question was over the assessor. He noted that the only reference to this in the order of February 5th was the establishment of his salary and the requirement that he attend the Tribunal every day. Revillagigedo said that he realized that his letter of January 2d on the question as to whether he or the Tribunal should appoint this official could not have been received prior to the promulgation of this order, but begged that this question of the assessor be seriously considered in the light thereof.<sup>75</sup> The reply to the above two letters came in a brief order of October 2d, enjoining compliance with the dispatch of May 22d, in so far as the assessor was concerned, and strict adherence to that of February 5th in regard to the

<sup>74</sup> *A.G. Virreyes*, Ser. II, vol. 16/169, No. 508; *A.I., Sec. 5<sup>a</sup>, Aud. de Méx.*, Leg. 2238, Doc. 72.

<sup>75</sup> Late in 1792 Beleña had been appointed Regent of the Audiencia of Guadalajara and hence forced to relinquish his post as assessor of the Tribunal. Thereupon the Tribunal claimed that it should exercise its former right to appoint its own assessor; this the Viceroy denied and named another Judge of the Audiencia, Don Ciriaco Gonzales Carbajal. Both sides appealed to the crown, and on May 22, 1793, as a corollary of the arreglo, it was ordered that the Tribunal appoint its own assessor; Tribunal to Minister of Indies, Jan. 12, 1793, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2238. Viceroy to same, Jan. 2, 1793, *ibid.*, Valdés to Revillagigedo, May 22, 1793, *A.G. Cédulas*, vol. 155, No. 156.



handling of avíos and the Mining Fund.<sup>76</sup> The Viceroy's remarks and requests on these two points were simply noted without comment. On July 29th the Tribunal acknowledged the order of February 5th, expressing its gratitude for the care with which it had been drawn.<sup>77</sup> Some months later a second dispatch expressed the fear that the Viceroy was using irregular means to delay the execution of the cedula of February 5th, and that he had in mind various steps designed to interfere with the proper powers of the Tribunal. Specifically the latter charged that the Viceroy wished to take unto himself the appointment of a fiscal to fill the vacancy caused by the death of Juan de Santelices Pablo, and also the filling of the other vacancy on the Tribunal; and that he wished to modify some of the sections of the cedula, or suspend their execution. Evidence was cited showing that the Viceroy had delayed transmitting the text to the Tribunal until long after its receipt, and that thereafter Revillagigedo had delayed further in taking the necessary measures requested by the Tribunal to put the changes into effect. These measures involved particularly the transfer of cases from the provincial *Juzgados de Alzadas* to the Tribunal and establishing the new judicial procedure in the *Diputaciones Provinciales*. Some other evidence of the Viceroy's unwillingness to see the order put into effect was cited, and, taken with the dissatisfaction he had expressed in his dispatch of May 29th, it seems probable that the Tribunal had some grounds for suspicion. Its protests were not in vain, as when the replies came from Spain they completely upheld the contentions of the Tribunal.<sup>78</sup>

In the meantime, progress had been made in Mexico toward the restoration of the Tribunal to its full membership and discharge of its proper functions. Gardoqui was informed on January 9, 1794 that a *Junta General de Minería* had been

<sup>76</sup> A.G. *Cedulas*, vol. 156, No. 92.

<sup>77</sup> Tribunal to Gardoqui, July 29, 1793; A.I., Sec. 5<sup>a</sup>, Aud. de Méx., Leg. 2238.

<sup>78</sup> A.I., Sec. 5, Aud. de Méx., Legs. 2245, and 2238.

duly held on December 31, 1793, in accordance with notices sent out the previous July, and persons had been elected to fill the vacancies on the Tribunal as shown by a list enclosed. The dispatch also stated that the clause of the order of February 5th relating to contentious jurisdiction had been put into effect and that everything was going smoothly in this regard.<sup>79</sup>

This event was important for a number of reasons. It was the first regular junta general held since 1784, and started the Tribunal off anew with a full slate of officials. It is also interesting to note that there was a very good geographical distribution of the offices; especially significant in view of the

<sup>79</sup> Tribunal to Gardoqui, Jan. 9, 1794. *A.I., Sec. 5, Aud. de Méx., Leg.* 2238; as will be seen, this was a slight exaggeration. The following is the list of persons elected by the Junta:

Lista de los Mineros que salieron electos por la  
Junta General de Minería para ocupar los  
empleos vacantes en su importante Cuerpo

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ADMINISTRADOR GRAL

Don Manuel García Zevallos, residente en Guana.<sup>\*10</sup>

DIPUTADOS GENERALES

- 1.º Don Juan Manuel Guilez — for nine years.
- 2.º Don José Manuel Valcarze y Guzmán — for six years.
- 3.º Don José Mariano Fagoaga, resid.<sup>te</sup> en Sobrer.<sup>te</sup> — for three years.

CONJUEZ DE ALZADAS DE MEXICO

Don José Antonio Otaegui.

CONSULTORES DE MEXICO

- 1.º Don José Luis Fagoaga.
- 2.º Don José Palacios.
- 3.º Don Juan Fernando Meoqui.
- 4.º Don Sebastian Heras Soto.

CONJUEZES DE ALZADAS DE GUADALAJARA

- 1.º Don Pedro Ponze de Leon.
- 2.º Don Andres Arzamendi.

CONSULTORES FORANEOS

- 1.º Don Fermin Antonio Apesecha . . . . . Zacatecas.
- 2.º Capitan Don Francisco Septiem . . . . . Guanaxuato.
- 3.º Don Juan José Yandiola . . . . . Sombrerete.
- 4.º Licenciado Don Felipe Fern<sup>o</sup> Riano . . . . . Guanaxuato.
- 5.º Don José Vizente de Anza . . . . . Tasco.
- 6.º Don Juan Antonio Peron . . . . . Zacatecas.
- 7.º Don Benito Compero . . . . . S.<sup>a</sup> Luis Potosí.
- 8.º Don Ygnacio Zavala . . . . . Ynguaran.

complaints coming from that locality was the election of a resident of Guanajuato as administrator-general. The detailed record of this junta general was forwarded to the Viceroy on February 28th. We will leave discussion of this to a later chapter where it and the subsequent juntas general which now succeeded each other with a reasonable degree of regularity will be discussed in connection with the later general history of the Tribunal. Before closing this chapter, however, there is one matter which, while it came up after the arreglo was completed, was directly connected with it and hence can best be dealt with here.

This had to do with the accounts of the Tribunal. It will be remembered that during the course of the arreglo one of the questions had been whether or not the Tribunal should present its accounts to the *Tribunal de Cuentas* for revision and approval. The order of February 5, 1793, had decided this in the negative, but required the Tribunal to submit its accounts to a careful audit by its consultores and present them to the junta general. This did not settle the dispute and the Tribunal raised further questions as to its responsibility to the *Tribunal de Cuentas* and the junta general. On October 30, 1793 it wrote that the former had, through a minor clerk, demanded its accounts for 1788-89, and begged a decision as to whether the precautions laid down in the Ordinances of February 5th were not sufficient.<sup>80</sup> The crown completely upheld the *Tribunal de Minería* and censured the *Tribunal de Cuentas* for its meddling.<sup>81</sup> On June 30, 1795, the new Viceroy, Branciforte, wrote that this dispatch had been received and that he had notified both tribunals, thus closing the matter.<sup>82</sup>

In addition to this dispute with the *Tribunal de Cuentas*, the Tribunal also raised the question as to how detailed accounts it was bound to present to the junta general. Strictly speaking

<sup>80</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2244, Doc. 2 b.*

<sup>81</sup> *A.G. Reales Cédulas, vol. 157, No. 257.*

<sup>82</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2244.*

it was the latter that raised the question. In a report on this junta dated February 28, 1794, the Tribunal stated that a number of the delegates had requested that the Tribunal furnish it with a detailed account, backed by vouchers, of all its financial dealings.<sup>83</sup> To this the Tribunal objected. It held that it complied with all the requirements of the Ordinances and the order of February 5th, by submitting to the junta a summary statement of income and expenses together with the actual condition of the fund, providing that the accounts had been properly kept and audited. The Tribunal also raised a more fundamental point. The delegates had said that the fund of the bank was theirs as representatives of the whole mining body and that the Ministers of the Tribunal were but its administrators. The Tribunal claimed that it had not received its jurisdiction from the miners but from the crown; and argued that while the fund might belong to the miners in the sense that it came from them, its management should be in the hands into which it had been given by the King. This argument that the Tribunal derived its authority from above rather than below, while unquestionably sound, scarcely seems a wise one from a body which had been actively fighting attempts by the royal government in Mexico to exercise authority over it. In another representation of the same date, the Tribunal disclosed that the new administrator-general, Zevallos, had suggested an alternative scheme, namely, that a committee should be appointed by the junta general to examine the accounts and report back. This was opposed by the rest of the Tribunal on virtually the same grounds as given above, and the further one that it would be used by the individuals named as a means of spite against the Tribunal or for embarrassing it for their own particular reasons.<sup>84</sup> The ruling on this subject came in a royal order of September 22, 1794, which, in addition to settling other points arising from the junta which will be dis-

<sup>83</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2246.*

<sup>84</sup> *Ibid.*

cussed later, resolved this question in the manner requested by the Tribunal.<sup>85</sup> It held that the inconvenience and possible prejudice which would arise from submitting the full accounts to the junta or a committee thereof outweighed the possible benefits, and hence the Tribunal should only be required to present a summary statement, providing its accounts were kept in strict accordance with the Ordinances and the royal order of February 5, 1793, and examined annually by the Tribunal and four consultores resident in Mexico. On the basis of the statement presented them, the delegates should have the right to make any suggestions or propose any changes they saw fit. This apparently closed this question for the time being. Some years later it appeared again when the Tribunal sought release from the requirement of having the consultores examine its accounts; but as this was due to subsequent developments, its consideration can be postponed to a later chapter.

This subject of the reorganization of the Mining Guild from 1786 to 1793 has been treated at some length for a number of reasons. In the first place, it affords us a considerable number of contemporary opinions as to the value of the whole system instituted provisionally in 1777 and fully established by the Ordinances of 1783. These opinions came from persons who were in a position to make an intelligent judgment and who represented various points of view. The consensus of these views was that in spite of the disorders in the past administration the system was fundamentally sound and of sufficient importance to deserve further trial. The final arreglo made relatively minor changes in the organization or functions of the *Cuerpo de Minería*, which is an indication that the government itself was convinced of the importance of a virtually autonomous mining organization. The subsequent complaints of the miners of the country against what changes were made would suggest that they too felt that the organization had

<sup>85</sup> A.G. *Reales Cédulas*, vol. 159, No. 46.

proved its worth.<sup>86</sup> All this is rather surprising in view of the abuses which were brought out in the last chapter and the attacks made on the Tribunal in the early days of the arreglo. Some reasons for the change in point of view have already been suggested, but the fundamental one must have been that its accomplishments were deemed to outweigh its shortcomings. We would seem justified in reaching the conclusion that at the end of this first stage of the Tribunal's history it was a success and had justified its creation in the minds of the persons best qualified to judge. From its later history we will attempt to see whether it merited this confidence and the importance given it.

From a broader point of view this study has also furnished an opportunity to see the government of New Spain, and, to a lesser extent, that of the mother country at work. As a result of this, one is impressed by two facts: first, the length of time which it took to settle the question, with the consequent seven years of uncertainty; and second, the thoroughness with which the whole matter was studied, and the intelligence and experience which most of those concerned brought to its consideration. Whatever the abuses of the Spanish administration, in this instance it made a genuine effort to understand the conditions and needs of the colony and shape the law to fit them. It would not, of course, be correct to generalize from this that the government was always so farsighted, as here it was dealing with the mining industry, always the object of special favor. In this case, however, the government deserves credit, particularly when it had seen the broad powers which it had granted abused by those to whom they had first been entrusted.

<sup>86</sup> Cf. chap. vi below.

## CHAPTER V

### ADMINISTRATIVE AND ECONOMIC ACTIVITIES AND ACCOMPLISHMENTS OF THE TRIBUNAL AND OTHER ORGANS OF THE MINING GUILD

THE REORGANIZATION of the Mining Guild which was the subject of the last chapter grew out of the Tribunal's mismanagement of its funds. While the administration of the Mining Fund and the financing of mines were the principal objects of the Tribunal's creation, there were other functions and responsibilities entrusted to it, as well as to the provincial deputations and the juntas general. It is the purpose of this chapter to shed some light on the manner in which these agencies discharged in practice the duties placed upon them by the Ordinances. This involves consideration of the effectiveness of the provincial deputations and the juntas and their relations with the central Tribunal. It also includes a description of the Tribunal as general administrative head of the organization and its efforts to promote the welfare of the mining industry. The manner in which litigation was handled and the subject of mining education are reserved for separate chapters.

This study may well begin with the juntas general. According to the Ordinances these triennial conventions were to be the media through which the industry as a whole would exercise its rights of self-government by the election of the members of the Tribunal and by receiving the latter's accounts and taking up any matters of interest to the industry. They were to be composed of representatives of all the reales or *asientos de minas*, with proportionately larger representation for the larger centers such as Guanajuato, Zacatecas, Pachuca, etc.<sup>1</sup> In practice the juntas general appear to have been dominated

<sup>1</sup> Cf. *Ordenanzas*, Tit. 1, Arts. 5, 6, 7. To qualify as a *Real de Minas* entitled to representation, a mining camp had to have an established population,

by the Tribunal, although at times they did make a stand for their rights. We have already studied the progress of the junta general held in the middle of the reorganization in 1789 and the disagreement which prevailed at that meeting over the qualifications of the candidates for the Tribunal; we have also noticed the next junta general, held in December 1793, at the conclusion of the reorganization.<sup>2</sup> Prior to these, only one meeting had been held subsequent to the promulgation of the Ordinances.

The machinery for holding this meeting was put in motion even before the Ordinances were published in Mexico, and in spite of some uncertainty on the part of the Tribunal the Viceroy ordered it to go ahead and convoke the gathering in December 1783.<sup>3</sup> It had not, however, been held by the 1st of June 1784, and we have no direct evidence as to the meeting of this junta; but on September 28, 1788, the Viceroy wrote that the consultor, Santelices Pablo, had called his attention to the fact that the last junta general had been held in June 1784, and that it was time for another.<sup>4</sup> Hence it appears that the first junta was held at that time and did no more than elect the consultores. The Tribunal could not have presented to the meeting a statement of its accounts in accordance with Tit. 1, Art. 16 of the Ordinances; otherwise many of the irregular financial transactions which came to light in 1786 would then have become evident. Why this junta general elected no deputies-general is not clear. Of the deputies serving in June 1784, both Ramón Luis de Liceaga and Antonio Villanueva were serving under interim appointments by the Tribunal itself in the places of Tomás de Liceaga and Marcelo de Anza who had died.<sup>5</sup>

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a church with a priest, a *Juez Real*, and *Diputados de Minería*, with six mines and four mills in active operation — Art. 6.

<sup>2</sup> See above, chap. iv.

<sup>3</sup> Viceroy to Tribunal, December 23 and 29, 1783, *A.G. Minería*, vol. 48, expediente 1, Nos. 14 and 17.

<sup>4</sup> *Ibid.*, expediente 7, No. 50, cf. chap. iii.

<sup>5</sup> Cf. chap. iii.



As we have seen in Chapter IV, elections to the Tribunal were suspended during the reorganization and persons were appointed by the King to fill some of the existing vacancies. Hence during these first years the junta general did not play a very important part in the government of the Mining Guild. With the junta general of 1789 a change began. We have seen that this gathering provoked active discussion as to the qualifications of members of the Tribunal and took up the election of an administrator-general and deputy-general as well as consultores and judges of appeal. Nevertheless, the meeting appears to have broken up in disorder and the Tribunal continued during the next few years to be composed of Elhuyar, Liceaga, and Barroso, with the Marqués del Apartado, senior consultor, or one of the other consultores, filling in the vacancy. Hence it was not until the junta of December 1793 that there was a real election of the Tribunal by the representatives of the whole Mining Guild. At this time there was a complete break from the past, new men being elected to all the positions on the Tribunal. The list of persons elected at this junta has already been given above.<sup>6</sup>

This junta asserted what it felt to be its rights more vigorously and successfully than any of its predecessors; and the election of entirely new members to the Tribunal, notwithstanding the terms of the Ordinances, is undoubtedly evidence of this independence. As soon as the junta assembled the delegates raised the issue, left open in 1789, of their right to discuss and vote on any topics of interest including the qualifications of candidates for the Tribunal. As in 1789, the Tribunal insisted that the sole duty of the delegates was the election of members of the Tribunal. This time, however, the delegates forced the Tribunal to give in temporarily, and prior to the election of the new officials all matters were discussed and decided by the full junta. Once elected, however, the new Tribunal reaffirmed its independence and refused to allow the

<sup>6</sup> See above, chap. iv. *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2245, expediente 20.

delegates to decide matters of general interest or concerning their particular districts, insisting on its own sole power to decide such matters. It was at this stage that the discussion arose as to the right of the junta general to receive detailed accounts from the Tribunal, already described in the preceding chapter. There was also a controversy over the secrecy of the records of the junta, the delegates wishing to be furnished with transcripts of the minutes and the Tribunal insisting on complete secrecy. A compromise was reached to allow a delegate to receive transcripts of the minutes of questions raised or proposed by him in sessions subsequent to the elections, so that he would have evidence to take home to his constituents that he had carried out their wishes.

It is clear that the delegates to this junta of 1793-94 asserted their independence and attempted to give effect to the theory that the Tribunal was properly their creature and servant rather than their master, and that they attained some measure of success. The session had no sooner adjourned, however, than the Tribunal took steps to regain the ground it had lost and to protect itself against attempts of future juntas general to assert authority. A representation to the crown, dated February 28, 1794, recited the history of the juntas of 1789 and 1793, explaining the pretensions of the delegates and the stand of the Tribunal.<sup>7</sup> The principal point which it wished confirmed was that the sole duty of the delegates was to elect members of the Tribunal, without having any vote on other matters that might come before it, not excepting the qualifications of the candidates. The Tribunal did not deny that the delegates should have the right and opportunity to bring up any matters of interest or concern to them, but held that after full discussion the decision should rest with it. The reply of the crown came at the end of the year, and not only upheld the Tribunal in regard to the sub-

<sup>7</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2246, expediente 5.* This expediente also contains the minutes of the junta on which the above is based, as well as the records of the dispute regarding the right of the junta to receive accounts.

mission of its accounts to the junta,<sup>8</sup> but confirmed and approved its position in virtually all its contentions.<sup>9</sup> On the same day Gardoqui sent another order directly to the administrator occasioned by the latter's difference of opinion with the other members of the Tribunal over accounts. This laid down the rule that when he disagreed with his colleagues he could ask to have the fact recorded in the secret book of the Tribunal, but that he must sign the decision, representation, or whatever it might be with the other members of the Tribunal in accordance with the vote of the majority, and that he must not make public his disagreement.<sup>10</sup>

The decision of the King upholding all its contentions represented a real victory for the Tribunal over the efforts of the provincial deputations to have more voice in managing the affairs of the industry. That the Tribunal recognized this is evident from a letter of February 28, 1795, to Garoqui expressing in the most profuse terms its gratitude to the King for his decision.<sup>11</sup> While this action strengthened the authority of the Tribunal, it may be questioned whether it did not weaken the Mining Guild as a whole in its relations with the government. By taking this position the Tribunal lost standing as the elected executive of an autonomous body and also weakened its own case in its efforts to administer the affairs of the mining industry without interference from the royal government. Whether these philosophical thoughts occurred to anyone at the time is doubtful. From the point of view of practical efficiency the attitude of the Tribunal was probably correct. To have left all questions arising in the juntas general to the decision of the delegates themselves would have been to open the door to interminable argument, delays, and intrigue. At all events from this time on the juntas general seem to have held pretty close to their special

<sup>8</sup> Cf. chap. iv.

<sup>9</sup> Gardoqui to Branciforte, Sept. 22, 1794, *A.G. Cédulas*, vol. 159, No. 4.

<sup>10</sup> *A.J.*, Sec. 5, *Aud. de Méx.*, Leg. 2246, expediente 5.

<sup>11</sup> *Ibid.*

function of electing the members of the Tribunal and to have played little part in influencing the affairs of the Mining Guild, at least down to the year 1815 when the parlous state of the industry demanded the coöperation of all elements.

The next triennial meeting was due to be held in December 1796, at which time there should have been elected a deputy-general to succeed Fagoaga; at the very end of 1795, however, Don Juan Manuel Guilez, elected in 1793 for a nine-year term, had died.<sup>12</sup> This meant that there would be two deputies to be elected in 1796 — one to succeed Fagoaga and one to fill Guilez's unexpired term. In view of this the two remaining deputies, Valcarce and Fagoaga, through the latter's brother, José María Fagoaga, resident in Spain, addressed a representation to the King on July 6, 1796, seeking to have their own terms extended, so that it would be necessary to elect only one new deputy.<sup>13</sup> This representation apparently had no effect. The junta was held on time in December 1796, and on the 31st of that month elected two new deputies-general — Don Francisco Gonzales de la Vega and Don Bruno Noriega. Fagoaga's services were, however, recognized by election to the post of associate judge of appeals of Mexico.<sup>14</sup> This junta also adopted unanimously a resolution urging the King to allow Elhuyar to remain as director permanently — a remarkable tribute to this European and the tact with which he had conducted himself.<sup>15</sup>

Before the next triennium had been completed the same situation arose again with the death of Noriega on January 26, 1799.<sup>16</sup> Thus the junta due to be held in December 1799 had the places of administrator-general and two deputies to fill, besides the usual consultores and judges of appeals. This junta was a little late in convening and the elections were held on

<sup>12</sup> Santiago Ramirez, *Datos para la historia del Colegio de Minería* (Mexico, 1890), p. 129.

<sup>13</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2245, expediente 20.

<sup>14</sup> Ramirez, *op. cit.*, p. 136.

<sup>15</sup> *Ibid.*, p. 136.

<sup>16</sup> *Ibid.*, p. 149.

January 4, 1800;<sup>17</sup> promotion and new blood were both in evidence, and the elections seem to have settled down at last into the pattern intended in the Ordinances.

From this date until the middle of the revolutionary period our information as to the triennial juntas becomes rather meager. Perhaps this is because they were more or less routine affairs concerned only with the periodic renewal of the membership of the Tribunal. A junta general was held in December 1802, at which D. Ignacio Obergón was elected deputy-general, and Valcarce associate judge of appeals; three new consultores were also elected.<sup>18</sup> The next junta general, due in December 1805, convened in January 1806. This elected the Marqués de San Juan de Rayas as administrator-general to succeed Fagoaga, and José Antonio Otaeguí as deputy-general, succeeding the former.<sup>19</sup> This deputy died the following June and the Tribunal elected as ad interim deputy-general, Juan Antonio

<sup>17</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2246, expediente 4.* Following is the full list of persons elected:

#### ADMINISTRATOR GENERAL

D. José Mariano de Fagoaga.

#### DEPUTIES GENERAL

D. Marcelo José de Anza.

El S.<sup>or</sup> Marq.<sup>a</sup> d S.<sup>n</sup> Juan de Rayas.

#### CONJUEZ DE ALZADAS OF MEXICO

D. José Manuel Valcarce y Guzmán.

#### CONJUECES DE ALZADAS OF GUADALAJARA

El S.<sup>or</sup> Varon de S.<sup>ta</sup> Cruz de S. Carlos.

D. Ynocencio Ballarta.

#### CONSULTORES DE MEXICO

El Regidor Don Ygnacio de la Peza y Casas.

D. Ant<sup>o</sup> Alvares Quiros.

#### CONSULTORES FORANEOS

S.<sup>or</sup> Conde de Valenciana, for six years.

D. Andres Sagas Herrera, for six years.

D. Bentura Arteaga, for six years.

D. Juan Francisco Mendizaval, for six years.

E. S.<sup>or</sup> Coronel D. Juan Francisco Echarri, for three years.

E. S.<sup>or</sup> Coronel D. Ygnacio Obregón, for three years.

Don Francisco Santos Quevedo, for three years.

<sup>18</sup> Ramirez, *op. cit.*, p. 186.

<sup>19</sup> *A.G. Minerta*, vol. 28, expediente 1, ff. 49-51.

de Terán.<sup>20</sup> No record has been found of the junta which should have been held in December 1808, but it appears that one was held and that D. Agustín Gonzales de Campillo was chosen deputy-general.<sup>21</sup> In 1810 the deputy Terán died and the Tribunal, elected D. Fermín Antonio de Apezucha to fill the vacancy until the next junta.<sup>22</sup> By the time 1811 came along the country was in such a state of disorder that it was impossible for the delegates to come to Mexico and the meeting was indefinitely postponed. The Tribunal, however, elected Fagoaga to serve once more as acting administrator.<sup>23</sup> The junta due in 1811 was eventually convened in 1813 and continued in session off and on until 1815; its history, which was of considerable significance, will be considered in connection with the final years of the Tribunal.

This concludes the history of the juntas general and their relations with the Tribunal. We have seen that except during the period of the reorganization and the Revolution they were held with fair regularity. They made an attempt in 1789 and again in 1793-94 to take a strong stand and establish themselves as positive factors in the control and administration of the Mining Guild. In this struggle with the Tribunal, the latter was eventually victorious and the juntas were reduced to mere agencies for the election of the Tribunal. While this function was, of course, of fundamental importance we are forced to the conclusion that the juntas general as a whole played but a minor role in the activities of the Mining Guild. As they were, in effect, the voice of the entire body of miners this conclusion would indicate that, in practice, authority and administrative policy emanated more from above than below and that the early promise of an autonomous and democratic body was not entirely fulfilled. It seems probable that the whole system would have been

<sup>20</sup> *Ibid.*, f. 10.

<sup>21</sup> Ramirez mentions him as a deputy-general in 1809, *Datos para la historia*, pp. 213-214.

<sup>22</sup> *Ibid.*, p. 215.

<sup>23</sup> *Ibid.*, p. 220.

more effective if the juntas general had exercised more real power and thus kept the Tribunal more in touch with the rank and file of the miners.

Most of the questions concerning the internal organization and authority of the Tribunal itself had been settled by the arreglo, or reorganization, and there were few developments of importance in the succeeding years. Some problems were left over, however, and these may be mentioned briefly before passing on to the provincial deputations. In 1792-93 there had been a dispute between the Tribunal and the Viceroy over the appointment of an assessor. Both sides claimed the right to make this appointment and carried the dispute to the crown. The King ratified the appointment made by the Viceroy for the sake of his prestige but said that in making it, the Viceroy had exceeded his powers and in the future the Tribunal should name its own assessor.<sup>24</sup> During the following years there was also some question over the appointment of a fiscal to fill a vacancy. The crown finally ruled that the Tribunal could fill the vacancy until the next junta general which should make the permanent appointment, good for life.<sup>25</sup> A similar question concerned the right of the Tribunal to make interim appointments to the courts of appeal of Mexico and Guadalajara. In this case, the Tribunal lost its case as the King ordered that such vacancies should be filled by the president and the remaining associate justice, or, in the absence of the latter, the president alone, such appointments to hold only until the next junta general.<sup>26</sup>

Between the years 1796 and 1800, there was a more serious dispute between the Tribunal and the consultores over the right of the latter to audit the Tribunal's accounts under the terms of the order of September 22, 1794.<sup>27</sup> The Tribunal elected in 1793 worked out a mutually satisfactory agreement with the

<sup>24</sup> A.G. *Cedulas*, vol. 155, No. 56; May 22, 1793.

<sup>25</sup> A.G. *Cedulas*, vol. 160, No. 98 and vol. 163, No. 15; cf. also, Ramirez, *op. cit.*, pp. 117, 120, 194, and 232.

<sup>26</sup> A.G. *Virreyes*, Ser. II, vol. 7/183, No. 57; *Cedulas*, vol. 167, No. 86.

<sup>27</sup> Cf. above, p. 214.

consultores, but the new Tribunal chosen in 1796 refused to adhere to this. Instead it claimed that the advisors had authority only over the accounts of the *Banco de Avíos* and not over the general accounts of the Tribunal. These pretensions, which were supported by the weakest of arguments and opposed by the advisors and the *fiscal de lo civil*, or civil fiscal, were eventually carried to the crown. The latter decided against the Tribunal in a decree which directed it to comply immediately with the clear terms of the earlier order and admit the advisors to the inspection of all its accounts. While the decision was almost a foregone conclusion the dispute does not reflect credit on the Tribunal.<sup>28</sup> One would have thought that with the exposure of the irregularities in their predecessors' accounts as an example behind them, the new ministers would have been meticulous not only in their observance of the Ordinances but in their desire to avoid any possible criticism as to their handling of the Tribunal's financing. Unfortunately this preoccupation with their dignity and prerogatives at the expense of more constructive activity was characteristic not only of these ministers but of subsequent members of the Tribunal, lending weight to the complaints of the provincial deputations that the Tribunal was more interested in its own position than in the welfare of the miners.

We will now turn to these provincial deputations and see something of the manner in which they discharged the obligations placed on them in the Ordinances and their relations with the central Tribunal. Title 2 of the Ordinances is devoted entirely to these agencies, describing in great detail the methods by which they were to be chosen, the terms of office, and duties. A number of the articles of Title 3 also deal with the duties and functions of the deputations, particularly their jurisdiction in

<sup>28</sup> The material on this controversy is contained in a dispatch from the Viceroy to the crown dated June 26, 1799, in *A.G. Virreyes*, Ser. I, vol. 37, No. 128; in two representations of the Tribunal dated Mar. 27, 1798 and June 2, 1799 in *A.J., Sec. 5, Aud. de Méx.*, Leg. 2246, expediente 5; and in a Royal Order of June 24, 1800 in *A.G. Cédulas*, vol. 175, No. 83.



administrative matters and over mining litigation, and the division of authority between them and the Tribunal. Our main interest lies in trying to determine as far as possible from the material available how the system worked out in practice, answering such questions as to how the electoral system functioned, what the relations were between the Tribunal and the provincial deputations, and how the latter discharged the duties entrusted to them.<sup>29</sup>

In the year 1783 there was a bitter dispute over the election of deputies in Guanajuato which was eventually carried to the King. The principal question at issue here was whether or not the outgoing deputies had the right to present a slate from which their successors should be elected. In Guanajuato it was the practice for the whole body of miners to elect quadrennially nine electors, who in turn elected annually the mining deputies. In accordance with this custom a junta of all the miners was held on January 12, 1783; this junta chose the electors and provided that they should meet on the following day under the presidency of the *Alcalde Mayor*. The latter was ill, and when the electors went to his house to meet, the outgoing deputies claimed the right to propose six names from among which the electors should choose the new deputies. The electors denied that their choice was thus restricted and the ground was prepared for a long and bitter dispute. The local authorities referred it to the Viceroy who, on the advice of the Tribunal, the fiscal, and the assessor, decided to refer it to the King. Both sides, through their agents, sent representations to the crown presenting their respective arguments.<sup>30</sup> The King, in an order

<sup>29</sup> What follows does not attempt to give a complete picture of the work of the provincial deputations. To do so would require extensive research into the records of the various provincial centers themselves—if they could be found. Numerous attempts were made by the author to locate the records of two of the most important districts, namely Taxco and Guanajuato, but they were all in vain. This does not mean that all have necessarily been destroyed, but they have been moved so many times that if they do exist at all they may turn up anywhere.

<sup>30</sup> The above material is taken from the two representations mentioned,

of October 30, 1783, called attention to Title 2 of the recently promulgated Ordinance and denied the right of the retiring deputies to propose names for their successors or in any way influence their choice.<sup>31</sup> This incident was finally closed when, on November 17, 1784, the audiencia (acting in the place of the Viceroy) wrote the electors and deputies of Guanajuato enclosing the royal order of October 30, 1783, and instructing them to elect two deputies in accordance with it for the ensuing year—with the provision that one should be elected for one year and one for two so that the system of electing one new deputy every year might be put into effect.<sup>32</sup> The election was duly held and although presumably the electors were the ones chosen in 1783 the two deputies elected were the Conde de la Valenciana, spokesman for the defeated faction, and Capt. Francisco de Septién y Arce.<sup>33</sup> The notice says that they were elected “according to the new Ordinances,” so perhaps by this means the friction was removed.

This dispute seems to have been the most serious that arose in connection with the election of deputies. With the explicit terms of the Ordinances as a guide, the elections in other districts in the ensuing years appear as a rule to have been held in a regular and orderly fashion. The *Gaceta de México* records from time to time the elections held in various reals in different parts of the country, such as Matehuala and Chihuahua, 1785, Zacatecas and Fresnillo, 1786, Pachuca and the other reals in that district, 1787, Fresnillo again in 1792, and Guadacazar, 1794.<sup>34</sup> While the great majority of elections were held without incident, there were from time to time irregularities or disputes which came to the attention of the Tribunal or Viceroy. Thus in

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found in *A.I., Sec. 5, Aud. de Méx.*, Leg. 2240, expedientes 7a and 7f; and also from a dispatch from the Viceroy to the Tribunal of March 22, 1783, in *A.G. Minería*, vol. 48, expediente 1, f. 6.

<sup>31</sup> Gálvez to Matías de Gálvez, Oct. 30, 1783, *A.G. Cédulas*, vol. 126, No. 58.

<sup>32</sup> *Ibid.*, No. 25, f. 50.

<sup>33</sup> *Gaceta de México*, Tomo I, No. 29, p. 235, Jan. 25, 1785.

<sup>34</sup> *Gaceta de México*, vols. I–VI, *passim*.

1789 the Tribunal learned that the *Alcaldes Mayores* in the district of Tepic were interfering in the election of deputies in Bolaños. The Tribunal protested to the Viceroy, who, on the advice of the fiscal, sustained the Tribunal and issued orders for the *Alcaldes Mayores* to cease interfering with the deputies.<sup>35</sup> In the same year there was a complaint from the Real de los Catorce that the intendant of San Luís Potosí was interfering in their elections; here again the Viceroy upheld the miners and ordered strict adherence to Title 2 of the Ordinances.<sup>36</sup>

In 1799 there was a rather humorous incident involving the character of the deputies in Zimapán. On May 30, 1799, the *Justicia Mayor* of Zimapán wrote the Viceroy that one of the mining deputies had seduced a local girl, and that upon discovery of the fact she had been put in the custody of the priest. Apparently she did not feel as badly about her betrayal as the authorities, since with the aid of the shameless deputy, she subsequently escaped from her priestly guardian. The puzzled justice was in a quandary and appealed to the Viceroy for instructions as to what to do.<sup>37</sup> A few months later another official, the treasurer, complained to the Viceroy in more general terms about the character of the local deputies. He said that the miners often elected unworthy persons of no standing or character—in violation of the clear terms of Tit. 2, Art. 3 of the Ordinances. This led to disrespect for the office, prejudice to the industry, and the embarrassment of other officials, such as himself, who had to work with the deputies. He asked the Viceroy to instruct the Tribunal to take measures to correct this situation.<sup>38</sup> This the Viceroy did on December 20th, ordering the Tribunal to make certain that in future elections in Zimapán properly qualified persons were chosen.<sup>39</sup> Although there were

<sup>35</sup> Viceroy to Tribunal, July 27, 1789 and Apr. 24, 1790: *A.G. Minería*, vol. 48, expediente 8, No. 30, and expediente 9, No. 9.

<sup>36</sup> *A.G. Minería*, vol. 48, expediente 9, No. 25.

<sup>37</sup> *A.G. Minería*, vol. 49, expediente 9, No. 65.

<sup>38</sup> *Ibid.*, No. 59.

<sup>39</sup> *Ibid.*, No. 60.

doubtless many other incidents that arose in connection with the choice of mining deputies, the records of which have disappeared, it seems probable that on the whole there was less trouble in this sphere than in those of the juntas general and the Tribunal. This may well be because the latter institutions were something new, while elections of local deputies had been held for many years and the practice was pretty well established.

An early illustration of the activities of the provincial deputations and their relations with the Tribunal came from Taxco in 1778-79, before the promulgation of the Ordinances but after the formation of the Tribunal. In 1778 a group of prominent miners in Taxco conceived the idea of reëstablishing the prosperity of the district by forming a company to open a major tunnel which would give access and drainage to the ore bodies of a group of abandoned mines in the "Cerro Rico de Compañã." This tunnel had been begun many years before at the expense of the Royal Treasury but never completed. They obtained the coöperation of the local mining deputies, and approached the *Justicia Mayor* or *Juez de Minas*, Don Miguel Francisco Moxica. Their proposition was that they were willing to put up the money and carry out the work on three conditions: (1) that they should have the right to denounce all the mines in the region which would be served by the tunnel; (2) that the owners of the abandoned mines would cede their claims to the company; and (3) that exemption from the *quinto* be granted until the sum expended on the tunnel was recovered and exemption of one-half of this tax thereafter. At the instance of Villanueva, the senior mining deputy, Moxica, called a junta of all the miners of the region to discuss the project. This meeting heartily endorsed the idea and the owners of the abandoned mines agreed before witnesses to make over their claims to the company. It was decided that two engineers should examine the territory and make a report. This was done and the engineers reported that the project was feasible, offered good chances of success, and if successful would be of the greatest possible bene-

fit to the whole district. Finally all the documents were assembled and forwarded to the Viceroy with a petition from Villanueva, in his own behalf and that of the others, that the three concessions mentioned above be granted.

The Viceroy referred the matter to the Tribunal for its opinion. The latter gave wholehearted approval to the project of the company and recommended that the three concessions be granted as in the best interests of everyone concerned, including the crown. The scheme was then referred to the civil fiscal who also gave it enthusiastic approval, with but one modification. He suggested that the concession of half taxes after the expenses were repaid should not be forever, but for a period of ten years, and that this privilege be strictly limited to this company, with no right to assign it. The matter was subsequently considered in a session of the *Junta de Real Hacienda* which approved it with the fiscal's conditions. The Viceroy ratified it on October 20, 1778, and reported to the King in a dispatch of January 27, 1779.<sup>40</sup>

This incident is of interest not only for the amazing speed with which it was handled — five months from the time it was first brought forward to Bucareli's final approval—but for the coöperation and breadth of vision shown all along the line. There was none of that petty jealousy and bickering so often present. The group that conceived the scheme was willing to take a risk; the local deputies and miners saw the public benefit, and the central authorities gave their wholehearted backing.

One fears that this example was the exception rather than the rule insofar as the general efficiency and intelligence of the provincial deputations were concerned. We have very little direct or detailed evidence of their work, but are fortunate in having one document which is of great interest. This is a report of Elhuyar to the Ministry in Spain dated July 15, 1791, and en-

<sup>40</sup> A.G. Virreyes, Ser. II, vol. 98/115, No. 4222; this letter is accompanied by a "testimonio" of the whole expediente.

titled *Reflexiones sobre las Diputaciones de Minería*.<sup>41</sup> This report was in a sense a supplement to the views expressed in Elhuyar's opinion presented to the *Junta de Arreglo* in January 1790. There, it will be remembered, the Director had suggested certain eventual changes in the organization of the Mining Guild which would have eliminated the elected provincial deputies and substituted a trained personnel who would begin as *Peritos* and work up to *Jueces de Minas* in reals of the second class and the first class, with the best finally occupying positions on the Tribunal. If that may be taken as his suggestion for the future, these *Reflections* embody his criticisms of the existing system.

Elhuyar began by saying that for the proper administration and ordering of the mining industry three things were necessary: (1) the taking of all measures possible for its encouragement and for economy in its operations and processes; (2) a strict administration of justice; and (3) continuous vigilance to ensure improvement in the planning and permanence of the mine-workings. All these were within the province of the provincial deputations because these were the agencies most directly in touch with the miners and which should be most concerned with improving the industry. He then proposed to examine the manner in which these duties were discharged.

The first could be carried out, he said, in two ways: by instruction and advice by the deputies to the individual miners as to how they might improve their operating methods, and by systematic planning and execution of measures which would be to the benefit of all the mines in the district. In practice neither of these important duties received any attention. The deputies, being simply mineowners without technical training, were not qualified to give advice to the other miners or to plan public works of value. Furthermore, since they had mines or businesses of their own to manage, and received no salary, they

<sup>41</sup> This document and the covering letter dated July 30, 1791, are in *A.I., Sec. 5, Aud. de Méx., Leg. 2243, expediente 4.*

could not afford the time to carry out any constructive program for the mines of their district. Hence the deputies felt that they fulfilled completely the duties of their office simply by listening to the eternal litigation that came before them.

Elhuyar next discussed the manner in which the second condition, namely the strict administration of justice, was fulfilled. Here he found even more serious failure than that already described. He discussed at great length the manner in which the conditions essential to a fair administration of justice were ignored in practice and painted an extremely unfavorable picture. It is unnecessary to go into all his detailed arguments, but we can summarize his conclusions. He said that the lack of knowledge and technical training of most of the deputies affected their handling of judicial affairs as much as it did their executive functions. The other essentials for a proper administration of justice, integrity and impartiality, he felt, were unusually lacking. Outstanding persons did not settle in the isolated mining centers and those who did had few judicial qualifications. The deputies served for only two years, were related to many of the parties to suits, and knew that in the future those who appeared before them as plaintiffs or defendants would sit as judges in cases in which they themselves might be involved. Hence their decisions were influenced more by favoritism, fear, and friendship than by justice based on knowledge. In addition to these general objections, he made three further charges against the deputies, the first one being that they themselves were largely responsible for the great number of suits involving mines. He said that it was the usual thing for a mine to be left quietly to its owner when it was not producing and then in the event of a bonanza it was subject to all manner of suits. This practice could be largely curbed, he felt, if the deputies would take a strong stand in a few such cases and give the plaintiffs the treatment they deserved. In the second place he accused the deputies of inordinate delays even where they decided the cases fairly. Instead

of the summary procedure prescribed in the Ordinances they permitted all manner of pleas and arguments, and often the cases were actually decided by the assessors or lawyers attached to the deputations instead of by the latter themselves as commanded by the Ordinances. Finally he criticized the ease with which a deputy might disqualify himself from hearing a case. They often did this, he said, simply to avoid the embarrassment of having to make a decision that would react against them. Not infrequently all those eligible to substitute for the deputies would likewise disqualify themselves, with the result that there were interminable delays and the cases had to be brought to the Tribunal in Mexico for decision in first instance.

Elhuyar next turned to the manner in which the mines themselves were worked and developed, pointing out that this was of particular importance to the crown and the public, as the mines belonged ultimately to the former and their continued production was of vital interest to the latter. Hence it was a matter of concern to both these parties that they be developed and worked in such a way as to assure as far as possible their continuing production over a long period and the extraction of the maximum amount of existing ore. The individual miner, however, had no thought for the future, being only interested in getting as much for himself as possible out of the mine. Hence there was no systematic development nor was the available ore extracted in such a way as to safeguard future operations. The result was that when the visible ore gave out the miner abandoned the mine, with no particular loss to himself, but grave prejudice to the crown and public, as it was left in such a condition that it would be very costly if not impossible to renew operations.<sup>42</sup>

It was for these reasons that the Ordinances laid down certain strict rules in regard to the internal workings and development of mines — which Elhuyar charged were scarcely observed at

<sup>42</sup> The shortcomings in the manner of working mines are shown in detail in Elhuyar's report on Guanajuato, given in full in Appendix D.



all. For example he cited the section which required every person in charge of the underground workings of a mine to be examined and certified as qualified by a *perito facultativo*.<sup>43</sup> Elhuyar doubted whether there was a single instance where this was complied with, and admitted that under existing conditions it was probably impossible.

Since anyone was free to denounce a mine, the usual procedure was for the owner, be he experienced miner or not, to start working his mine himself until it showed sufficient profit to justify the employment of a manager — and even then the manager was usually chosen more for his trustworthiness and knowledge of accounts than his practical knowledge of mine operations. The latter were usually left in the hands of the best of the actual workmen, who very rarely had any training in mathematics or surveying. The result was, as has been said, that the operations were planned and carried out blindly. The deputies, of course, were the ones to see that these important Ordinances were enforced, but for various reasons this was impossible. In the first place, there were very few engineers in the whole country, let alone one in each real as envisioned in the Ordinances. Because of this lack the deputies consulted, when necessary, practical miners who usually had little or no scientific training, and in addition had their own private obligations as mineowners themselves or employees of others. This condition, he thought, would be remedied somewhat by the School of Mines, but he felt it could not be cured until the engineers and deputies received some public salary and were at least partially independent of private miners. Likewise the *visitas de minas*, or mine inspectors, prescribed by the Ordinances were practically ignored; and while the deputies were particularly charged with this duty, under existing conditions one could not expect them to abandon their private affairs to give the time to these inspections when they received no pay for doing so and when there were no engineers to aid them. As a result of this failure, no reports of

<sup>43</sup> *Ordenanzas de Minería*, Tit. 9, Art. 2.

conditions and operations in the various districts were sent to the Tribunal, as ordered, and the latter was unable to make any general report to the crown on the industry as a whole. But even if the inspections were made and there were trained engineers to advise, would the deputies, under existing conditions, when they themselves were mineowners, require their friends and relations to spend money to conform to the Ordinances? He answered that it would be too much to expect.

With this Elhuyar concluded his criticism of the existing provincial deputations. While he appeared to have no very high opinion of the personnel, he indicated definitely that in his opinion the system itself was at fault and should be changed. As an improvement he offered the system proposed in his Opinion to the *Junta de Arreglo* written the preceding year.

The wholesale indictment of the provincial deputations leaves one wondering as to whether or not they really fulfilled any useful function. While the fact that Elhuyar was an outsider without any particular interest in local autonomy may have prejudiced him to some extent, there is no positive evidence of accomplishment to contradict him. In 1797 the King expressed his displeasure that the inspections were not being held in accordance with the Ordinances and ordered the Tribunal to see to it that the deputies carried out this duty.<sup>44</sup> About this time the Tribunal itself and the deputation of Guanajuato sought to take measures to make these inspections effective and regularize the activities of the engineers who were beginning to graduate from the School.<sup>45</sup>

It is perhaps due to the fact that the deputations were engaged in little but the hearing of suits that we have such little material regarding their activities. Except upon rare occasions they made no general reports on conditions to the Tribunal. Most of the matters which came to the Tribunal from the deputations, outside of legal matters, involved disputes of some sort

<sup>44</sup> Varela to Bronciforte, Feb. 12, 1797, *A.G. Cédulas*, vol. 166, No. 97.

<sup>45</sup> See below, chap. vii.

over jurisdiction, and it is this type of subject to which most of the material uncovered refers. Before studying this, we should answer the question as to whether or not Elhuyar's criticisms resulted in any change in this system. In general the answer is no; certainly his proposal of a hierarchy of trained administrators was never adopted. A slight attempt was made to improve the administration of justice by paragraph 9 of the reorganization order of February 5, 1793, which provided that the intendant or *Juez de Minas* should sit with the deputies in all cases in first instance and which also made the Tribunal into a court of appeals. As mentioned above, at the turn of the century some effort was made to systematize the mine inspections and other regulatory activities of the deputies and engineers. In general, however, the provincial deputations continued merely to exercise their routine functions of recording and checking the denouncement of mines and listening to mining litigation. without contributing very much to the progress of the industry or the prosperity of their respective districts.

This relative ineffectiveness did not, however, prevent them from being very jealous of their prerogatives. In 1790 the justice and deputies of Quautla Amilpas complained of interference by the Tribunal in the exercise of contentious jurisdiction, in the decision as to whether it was within or without the twenty-five league radius from Mexico City, and in the holding of its elections for deputies. The Viceroy reprimanded the officials of Quautla, saying that while they had the right to hear cases if they were beyond the twenty-five mile radius, the decision of this question and the other matters were administrative matters and belonged solely to the Tribunal.<sup>46</sup> Again after the junta general of 1794, a number of representatives of the principal *Reales de Minas* complained to the King that the Tribunal was exceeding its powers at the expense of the provincial deputations.<sup>47</sup> This feeling of the provincial bodies against the Tribunal will be-

<sup>46</sup> A.G. *Minería*, vol. 48, expediente 9, No. 54.

<sup>47</sup> A.I., Sec. 5, Aud. de Méx., Leg. 2444, expediente 6.

come more evident in the study of contentious jurisdiction in the next chapter. But in spite of this jealousy of their dignity, there is little evidence to reverse Elhuyar's unfavorable verdict as to their accomplishments. The conclusion seems forced upon us that the provincial deputations failed to discharge to any considerable degree the responsibilities placed upon them by the Ordinances.

We can now turn back to the Tribunal itself and study some of its various activities and the ways in which it served the mining industry. At the end of this chapter a résumé will be given of all the matters which came before it in the years 1789-94, affording a general summary of its activities. A number of the subjects which engaged its attention deserve rather more extended treatment.

Being charged with the welfare of the mining industry it was natural that the Tribunal should be particularly concerned with those disasters which have always and in all countries overtaken mines. There were a number of such calamities during the period under review and in its handling of them the Tribunal appears in a favorable light. The first occurred in Guanajuato in 1780. The whole country, and particularly the mining industry, had been suffering for a year from a variety of scourges. Late in 1779 a serious epidemic of measles had broken out in Veracruz and spread over the whole country, crippling the labor supply not only for mining but for agriculture. Previously there had been a severe drought, and the combined effects caused a serious food shortage. At the same time the war with England had interfered with the import of goods from Europe, particularly those needed in mining, such as iron, lead, and, of the most importance, quicksilver. As a result of all this many mines had been forced to shut down, and even those which kept going in order to prevent flooding were crippled by the inability to convert their ore into silver. Then to climax all this came a series of disasters in Guanajuato, the richest real

of the whole country. On the sierra to the northwest of Guanajuato there were three mines one above the other, first the famous Valenciana, above it the San Ramón, also a rich mine, and finally the Santo Cristo de Burgos. The upper workings of San Ramón had approached the lower levels of the Santo Cristo and in the evening of July 15, 1780 the intervening rock gave way and the upper mine virtually collapsed on the lower. Some three hundred miners were buried and the San Ramón filled with water and debris from the Santo Cristo. Part of the Valenciana, lying still lower, was then overwhelmed by water and rock from the San Ramón which could no longer bear the strain. Less than two weeks later, before the repair of this damage had scarcely begun, there were terrific rains, which, pouring down the slopes surrounding Guanajuato, filled the little river which flows in a restricted channel through the center of the city. The river broke its banks and overran all the lower part of the city destroying bridges, storehouses, shops, a number of mills, and flooding the famous Rayas mine.

The local mining deputation took what measures it could to alleviate the situation and promptly notified the Tribunal of the disasters. The latter met on August 8th and wrote the Viceroy of its desire to do everything possible to help. It characterized the disaster of the San Ramón and Valenciana mines as one of those fortuitous events which were bound to occur occasionally. The only questions to be decided were whether the owners of the Valenciana were entitled to damages because of carelessness on the part of the owners of the higher mines, and how to assure more careful inspection of mines in the future. As to the flood, this was not the first time it had occurred, and it was bound to recur in the future with disastrous effects, given the topography of the region and the construction of the city, unless preventive measures were taken. The Tribunal wished to plan such measures, and understood that a survey had been made a number of years before by an army engineer, but for some reason nothing had been done. Hence it requested from

the Viceroy the records of this survey. The Viceroy forwarded these on the following day, and asked for a report of the Tribunal on what it thought should be done. Shortly thereafter the latter commissioned Velásquez de León to proceed to Guanajuato and make a personal inspection of the situation, with authority to plan and execute such measures as he might deem best to help the situation and prevent a repetition of the floods. Upon being notified of this the Viceroy also commissioned Velásquez to represent him and the government, granting him broad powers and instructing all local officials to aid him. He was also given authority to decide the liability of the owners of the San Ramón and Santo Cristo mines to the Valenciana. Just what the results of Velásquez's survey were we unfortunately do not know, but it is a relief to find that the Tribunal, which at this time had many shortcomings, was able to act swiftly in an emergency and to enlist the hearty cooperation of the Viceroy.<sup>48</sup>

In 1784 there were again disasters in Guanajuato, and once more the Tribunal responded quickly. On January 19th it received unofficial reports of severe earthquake tremors in the district which had continued for several days. These had terrorized the population and caused most of the mine workers to flee to outlying districts leaving the mines deserted. The Tribunal met on the 21st and adopted a resolution taking cognizance of the situation and authorizing the deputy-general Liceaga to proceed as soon as possible to Guanajuato. He was granted full powers to act in the name of the Tribunal and take all measures which the Tribunal itself might take to reestablish the mines on an active basis, and instructed to report back to the Tribunal. At the same time the latter wrote the Viceroy notifying him of the events and its action, and re-

<sup>48</sup> The above information is contained in a report from the Tribunal to José de Gálvez dated Oct. 7, 1780; *A.I., Sec. 5, Aud. de Méx.*, Leg. 2240, expediente 11b; and in correspondence between the Tribunal and Viceroy from August 8 to Nov. 22, 1780: *A.G. Minería*, vol. 47, expediente 8a, Nos. 9, 10, 11, and 14.

questing his approval and instructions to the royal officials to aid Liceaga.<sup>49</sup> Before Liceaga could start, later reports were received indicating that the shocks had ceased and that the inhabitants were drifting back and the mines gradually reopening. Hence on the 26th the Tribunal wrote the Viceroy that it was in doubt as to whether Liceaga should go at once or wait for a few days for more definite and official news.<sup>50</sup> Gálvez replied the following day approving the action of the Tribunal but suggesting that its execution be suspended; meanwhile the ministers should exert every effort to learn the true state of affairs and what damage had been done to the mines.<sup>51</sup> This incident, unimportant in itself, is cited simply as evidence that the Tribunal was pretty well on the job and concerned itself with the welfare of the industry.

The next calamity of which we have records occurred in Bolaños in 1787, where on March 5th a disastrous fire broke out which virtually destroyed the seven principal mines of the district, belonging to Juan de Sierra Uruñuela and Isidoro de Zarachaga. On March 27th the Viceroy wrote the Marqués de Sonora advising him of the catastrophe and saying that the local mining deputation was doing everything possible and that the Tribunal and other agencies in Mexico were awaiting fuller information.<sup>52</sup> On June 23, 1788 the Viceroy, Flores, sent a long report on the question to Valdés.<sup>53</sup> He said that Uruñuela had drawn up a request that the Tribunal lend him \$200,000 and that the produce of his mines be relieved of the royal taxes for a period of fifteen years. With this aid he promised to set about the arduous task of cleaning, repairing, and reopening the mines. The Viceroy received reports from the deputies of Bolaños and the various royal officials all of whom recommended that the privileges he requested be granted.

<sup>49</sup> *A.G. Minería*, vol. 48, expediente 2, No. 10.

<sup>50</sup> *Ibid.*, No. 8.

<sup>51</sup> *Ibid.*, No. 9.

<sup>52</sup> *A.G. Virreyes*, Ser. II, vol. 1/141, No. 202.

<sup>53</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2243, expediente 2.

They said engineers had checked what would have to be done and that Uruñuela's estimates were very conservative. If this work was not done and the mines were not rehabilitated, it would mean the certain ruin of the whole real and a great loss to the country. They added that over the course of many years Uruñuela had spent large sums of his own in developing, cleaning out, and draining these mines, that between 1754 and 1787 they had produced thirteen million pesos' worth of silver on which the corresponding royal taxes had been paid, and that Uruñuela was in every way worthy of the royal favor. The Tribunal in Mexico confirmed these views and recommended that the exemption be granted. At the same time it regretted that it was unable to supply the \$200,000 due to the shortage of its funds and the investigation then in progress. The Royal Treasury officials also recommended that the tax exemption be granted as in the end the benefit to the crown from having the mines restored would far outweigh any temporary loss. For all these reasons the Viceroy decided to grant the exemption tentatively for a period of eighteen months until the King's decision could be learned. The King saw the justice of the requests and on May 23, 1789 approved the exemption from taxes.<sup>54</sup>

Another cause in which the Tribunal and some of the local deputations did useful work for the miners of the country was in securing at least partial exemption from the burdensome alcabala. For a period of over ten years beginning in 1780 there were continual disputes between the miners and tax collectors over the liability to pay the alcabala on the products and by-products of mines and supplies brought into the *reales de minas* and used in the extraction and reduction of the ore and maintenance of the miners.

The background of this dispute is not too clear, but from what we know a reasonably plausible picture can be drawn. There seems to have been a belief widely held among miners

<sup>54</sup> A.G. *Cedulas*, vol. 143, No. 60.



that mine supplies and the produce of mines had always been exempt from the alcabala,<sup>55</sup> and, whatever the basis of it, this exemption was apparently allowed in practice at least until 1777. No law or ordinance has been found which categorically exempts the produce of mines or the supplies necessary for their exploitation, but the theory may have been drawn by implication from two sections of the old mining code in the *Nueva Recopilación de Castilla*. The ordinances which imposed the royal tax, or the *quinto* (later reduced to the *diezmo*), all ended with the words "and all that remains after deducting such (tenth) part they may have and retain to themselves."<sup>56</sup> It is also provided in this code that all the by-products of the reduction of the ore, "may and shall remain for the owners of the said mines; — . . . not being liable to pay us anything, and no impediment or hindrance shall be interposed in respect thereof."<sup>57</sup> It would seem that from these sections the implications had been drawn that the quinto was the sole tax to be levied on the produce of the mines, and hence that the sale of ore, bullion, or by-products was not subject to the alcabala. As for the exemption of supplies brought into the mining centers, even less direct justification for an exemption has been found in the laws. The only section upon which it might be based by a broad interpretation is Ord. LXXVIII of the above-mentioned code, which is as follows:

Also we ordain and command, that all persons whatsoever, who shall be willing to carry provisions, maintenance and other things to such mines, for the support of those who may abide or work in them, shall be at liberty to take and carry out, and may take and carry out the same freely, from all the cities, towns and places of these our kingdoms and lordships. And that the justices thereof shall not prevent them nor lay any embargo upon them, nor put any impediment in their way, nor enhance the price; but that, on the contrary, they shall assist and favour them, that the aforesaid mines

<sup>55</sup> Cf. Sec. 14 of the "Representación" of 1781, cited below.

<sup>56</sup> *Recop. de Castilla*, Lib. 6, Tit. 13, Ley 9, Ords. III-VI.

<sup>57</sup> *Ibid.*, Ord. XI; on both these cf. also Gamboa, *Comentario*, pp. 65-67.

and the persons who may be concerned in them may always be provided and supplied therewith.<sup>58</sup>

Whatever the legal basis for the exemptions claimed, the facts appear to be that prior to 1778 the collection of this tax had been farmed out and, under a loose administration, the miners had escaped payment. A stricter administration had begun in 1753, but it was not until October 3, 1776 that the farming out of this tax was ordered stopped and its collection put directly in the hands of official collectors under a *Director General de Alcabalas* attached to the Treasury.<sup>59</sup> The new system appears to have been put into practice on May 14, 1777.<sup>60</sup> Some attempts may have been made during the next few years to collect this tax on mine supplies,<sup>61</sup> but it was not until the war with England forced a tightening up in the collection of taxes that the matter really came to a head.

In the year 1780 two decrees were issued to improve the administration of the tax and these stirred up a great deal of trouble. The first was an order dated August 29, 1780,<sup>62</sup> which provided that a record be kept in the customs house in Mexico and all other places of all goods taken out and their destination; and that at the time of taking them out the withdrawer should pay the amount due as alcabala by way of deposit, and be given an invoice to accompany the goods. If this invoice should be returned within a certain length of time with evidence that

<sup>58</sup> *Recop. de Castilla*, Lib. 6, Tit. 13, Ley 9; cf. Gamboa, *op. cit.*, pp. 371-372.

<sup>59</sup> Beleña, *Autos Acordados*, vol. 1, 3<sup>a</sup> folio, p. 75. Cf. also, Gálvez, *Informe General*, pp. 100-110, and Priestley, *José de Gálvez*, pp. 355-357.

<sup>60</sup> From an "Auto" of the Administrador de Alcabalas of Taxco, D. Juan de Villanueva y Aparicio, dated Jan. 28, 1781, *A.G. Minería*, vol. 214, f. 427.

<sup>61</sup> It is stated in the Representation of the Deputies of Guanajuato, Zacatecas, etc., of 1781, discussed below, that in 1779 an attempt was made to collect the alcabala on mine supplies destined to the Marqués de Apartado and Don Pedro de Anza; and that on an appeal to the Viceroy the latter ruled mine supplies exempt from this tax and ordered the refund of the amount collected. No official order has been found to substantiate this statement and it scarcely seems in harmony with the orders of 1780, but due to the change of Viceroys it may have been true.

<sup>62</sup> Beleña, *Autos Acordados*, vol. 1, 3<sup>a</sup> folio, pp. 81-82.

the tax had been paid at the time of the sale of the goods his deposit would be returned. This obviously would make it difficult for mine supplies to avoid payment of the tax, as it would be hard, for example, for a merchant in Mexico City to prove that a consignment of shovels taken from the customs house in Mexico City was destined for a miner in Taxco; he would probably be forced to pay the tax and either collect it directly from the miner or add it to the price of the articles. On October 8th another decree raised the basic rate of the tax from 6 to 8 per cent and applied it more directly to the miners.<sup>63</sup> Apparently some question had already been raised as to the liability of mine supplies as one paragraph of the order was specifically devoted to this class of goods. It ordered the collectors of the alcabala not only to keep a careful record of all goods destined for mines and delivered to them, but to collect from the persons introducing them the corresponding tax to be held as a deposit until the King should decide as to the liability of such goods. There were to be excepted from this rule the so-called "eleven ordinary classes" — which were not described, but of which there was said to be record in the Direction General and which had always been exempt. It was added that the alcabala should be collected from all goods delivered to mines, including the eleven exempt articles, if the mineowner should sell or exchange them, even if it were with another miner. Just what these eleven exempt articles were we cannot tell; they may have been foodstuffs; that they did not include many essential supplies is evident from the strong protests the enforcement of the order brought forth.

The first notice we have of these protests is a representation of the *Tribunal de Minería*, printed early in 1781 and apparently written in December 1780.<sup>64</sup> This long document began by saying that the Tribunal had been receiving complaints

<sup>63</sup> *Ibid.*, II, 14-17.

<sup>64</sup> *Representaciones del Real Tribunal de Minería a favor de su Importante Cuerpo*; imp. en Mexico por Felipe de Zunigo, . . . ano de 1781.

from the various reals concerning the system of collecting the alcabala for some time, and felt itself bound to bring the situation to the attention of the Viceroy. Apparently these protests had begun with the new centralized administration of alcabalas but had grown more numerous in recent months. The Tribunal felt that both its ancient privileges — or *fuero* — and provisions of the law itself were being violated and that the miners were entitled to prompt relief. The argument itself was in two separate parts, the first concerning persons, and the latter, objects.

In the first part they admitted that the instructions to collectors exempted from the alcabala metals and the by-products of the reduction of the ore when actually sold by miners themselves. But the tax was collected when these articles were sold by middlemen or when sold by miners to persons other than those who were actually going to use them. The argument was then devoted to showing that under such circumstances the exemption of miners was meaningless, and to emphasizing the important role played by these middlemen, or *rescatadores*. It was pointed out that the by-products of the ore of one district — such as lead and litharge — were necessary for the reduction of the ores of another district. The miners themselves were not able to sell these products directly to other miners in distant regions and hence made use of the *rescatadores* who were able to bring together the supply and the demand.

The remainder of the document was devoted to arguments in favor of the exemption of other articles connected with mining. Having dealt with the produce of mines — both the metal and by-products — the point was made that the sales of mines themselves should be free from tax, since mines were only of value for the ore which they produced and this was taxed by the quinto. From here the petition was extended to cover every class of mine supplies — food, clothing, tools, wood, and so forth. The general basis of the argument was that the mines were situated in remote regions, that they needed

a constant abundance of supplies to produce in any volume, and that nothing should be done to discourage this flow of goods, which resulted in a corresponding flow of silver of great benefit to the crown and country. Another argument was made in favor of the exemption of food and clothing on the ground that, as these goods were brought in, there was in reality no sale, but only an equitable distribution to the workers — in the same way that maize distributed to peons or sold to poor Indians was exempted from the tax in 1771.<sup>65</sup> The representation went on to cover everything used in the mining and the reduction of gold and silver. While it was stretched rather fine in places, in general the argument was plausible if one accepted the fundamental thesis that all these materials were used solely for the production of gold and silver and that these were subject to a special and all-inclusive tax of their own.

Before any action could be taken on this representation, further protests came pouring into the Viceroy from the provincial deputations, via the Tribunal. These were mostly based on the manner in which the decrees of August and October 20, 1780 were being interpreted by the collectors in the various mining centers. Events in Taxco during January and February of 1781 may serve as an example of the grievances.

About January 25, 1781 the mining deputies of Taxco wrote to the administrator of alcabalas for the district of Taxco and Iguala,<sup>66</sup> saying that he had been attempting to collect the tax on mine supplies not only on goods introduced since the publication of the decree of October 20, 1780, but on all goods brought in since the new system was established in 1777. They were willing to pay the tax by way of deposit until the King should decide on the liability, in accordance with the recent decree, on all goods brought in subsequent to its publication, but they did not feel that it could be applied in a retroactive

<sup>65</sup> Cf. Beleña, *op. cit.*, vol. I, 3<sup>a</sup> foliage, p. 83.

<sup>66</sup> This correspondence and what follows is in *A.G. Minería*, vol. 214, ff. 423-439.

manner to goods introduced prior to publication, and were determined to oppose any such interpretation. The administrator, Juan de Villanueva y Aparicio, replied with an order for the deputies to file a sworn list of all mine supplies introduced since May 14, 1777; after this was done their petition would be considered. Furthermore, if the list was not filed all legal measures would be taken against them. The senior deputy's answer to this order was that he would pay the deposit on goods entered since October 20, 1780, but not on earlier ones and that he would resist any attempt to collect the unjust tax. The administrator ordered that, notwithstanding this reply of de Viedma, all miners who owed taxes should make sworn returns and pay at once or he would call upon the *alcalde* to take civil and criminal action. A list of the miners against whom the tax was assessed was attached to this order on February 3d, with the amounts due from each one — totalling 3447 pesos; and on the same day the clerk was ordered to proceed with the collection of these amounts. On February 7th de Viedma was served with the administrator's order and replied as before that he would pay the amount due since October 20, 1780, but nothing assessed prior thereto, and demanded that the two amounts be separated. On the following days the other miners were also served with the order and all returned the same reply. In view of this, on February 13th, the administrator's clerk appeared before the *alcalde*, showed him the order of January 31st and the replies of the miners, and requested his official assistance in enforcing collection of the taxes assessed. The *alcalde* granted the request and forthwith ordered the lieutenant of the *alguacil* to proceed with the clerk to the enforcement of the order. On the same day these two once more visited de Viedma and served him with an order to pay \$1561, being the amount of *alcabala* assessed on supplies introduced by him since May 14, 1777. This time de Viedma agreed to pay under compulsion and protest, stating that he had been shown no proper orders requiring payment of the

tax and no proper accounting of the amount alleged to be due. He also demanded copies of all documents relating to the case and let it be understood that the payment was only made as a deposit until the King should finally decide the liability. On the succeeding days the clerk and alguacil enforced payment of the taxes by other miners on similar terms and under similar protests on their part. Finally on February 17th the administrator gave instructions for copies of all these documents to be given to the deputy de Viedma as requested.

This evidence presented by the deputation of Taxco, together with the protests from other districts, led to the formulation early in March 1781 of a representation to the Tribunal by Lic. Luis Galiano and D. Baltasar de Vidaurre, acting as attorneys for the deputations of Guanajuato, Zacatecas, Taxco, Sombrerete, Fresnillo, and Tlехuilotepec.<sup>87</sup> This stated that the miners of all these regions were suffering grave prejudice from the misinterpretation by the collectors and administrators of alcabalas of the decrees of 1780 and the illegal collection of the tax. They asked the repeal of the decree of October 20th requiring the deposit, and an interpretation of that of August so that it would not apply to supplies actually brought in by miners themselves for distribution to their workers. They granted that the reason for requiring a deposit was to prevent the taxpayer from avoiding payment by continued litigation, but pointed out that in this case the liability was still undecided and the miners had no way of speeding up the decision of the King. They felt that all this was a threat to their traditional and legal privileges, but the crowning blow had been the retroactive interpretation given the order of October 20, 1780 by the collectors and their insistence on exacting these back taxes. They cited the evidence from Taxco, and stated that while it was not known whether the same procedure had as yet been followed in other reals it could be assumed

<sup>87</sup> This representation and the succeeding documents are in *A.G. Minería*, vol. 214, ff. 439 b-456.

that it would be, as the collector in Taxco had said he was acting under instructions from the Superintendent-General. Hence the attorneys requested the Viceroy most urgently to order the collectors to cease exacting the tax on goods bought prior to October 20, 1780, and to refund the sums paid under compulsion in Taxco, even if he felt unable to grant their other requests. Finally the Tribunal was requested to give this representation its approval and forward it to the Viceroy. On March 21st the Tribunal did send all the above, including the documents from Taxco, to the Viceroy, with a letter of its own, heartily endorsing the representation, recalling its own earlier petition, and urging that something be done promptly to relieve the situation. On March 23d Mayorga forwarded these papers to the fiscal to be added to the earlier ones in the file.

Apparently the government realized the seriousness of the situation and took fairly prompt action. On April 28, 1781 the Viceroy wrote the Tribunal that in regard to the questions raised concerning the liability of mine supplies for payment of the alcabala he had issued an order in accordance with the opinion of the fiscal of April 18th, which opinion he enclosed.<sup>68</sup> Unfortunately this opinion is missing so we do not know directly what the order was. It appears, however, from subsequent documents that this order was a great victory for the miners, as it is said to have decreed "that there shall be exempt from the Royal Tax of the alcabala all implements, tools, and supplies which are directly used for the working of mines, or the reduction of ore, or drainage projects, such as iron, steel, beasts, hides, tallow, cordage, salt, magistral or other articles destined for the same use, whether they be sold to miners, shareholders (in mines), brokers (*rescatadores*), or workers, when destined for the said working of mines or reduction of ore." <sup>69</sup>

<sup>68</sup> *A.G. Minería*, vol. 47, expediente 9, No. 5.

<sup>69</sup> From a letter to the Viceroy from the *Diputación de Bolaños* of Feb. 8, 1782, referring to this order of Apr. 28, *A.G. Minería*, vol. 48, ff. 544/46.



This would seem to have granted virtually all the requests of the miners and should have settled the dispute. But such was not the case and the matter dragged on for nearly ten years. At first the difficulty appears to have been due to the unwillingness of the Administration of Alcabalas to put the order into effect. On July 24th the Tribunal protested that the Viceroy's order exempting mine supplies was not being observed, and on August 17th the latter replied that he had inquired of the Director-General why the order had not been communicated to the agents in the field; the latter had replied giving the reasons for the delay and saying it had been put into effect; and the Viceroy expressed confidence that there would be no more trouble.<sup>70</sup>

This confidence proved to be premature. The Administration of Alcabalas apparently was determined to use every possible excuse for collecting the tax on mine supplies. The dispatch of February 8, 1782 from the deputation of Bolaños to the Viceroy, already cited in part, was a strong protest against a new practice on the part of the Administration. It charged that, in spite of the Viceroy's general order, the Director-General of Alcabalas had on January 3, 1782 issued a circular order, recently received in Bolaños, by virtue of which the local administrator had begun to exact the tax on the goods exempted by the Viceroy when introduced by itinerant muleteers, even when they were sold by the latter directly to miners or refiners and not to other individuals. This had caused such anger among the vendors that they had sworn they would never return no matter what the need of the mines. Faced with ruin, the latter had been forced to pay some taxes and were fearful of what would be demanded in the future unless the Viceroy took some action. This order of the Director of Alcabalas, if correctly reported, would seem to have been distinctly contrary to the spirit of the Viceroy's decree. Unfortunately we have no record of what action was taken as a

<sup>70</sup> *A.G. Minería*, vol. 47, expediente 9, No. 14.

result of the protest, but in the long run this was not important, as soon after this the crown itself began to take a hand in the controversy.

After notifying the Mining Tribunal and the Director of Alcabalas of his decree of April 24, 1781, Mayorga had sent it to Spain for the King's approval. While it was being considered by the Council, there arrived the Tribunal's representation discussed above and another from the Director of Alcabalas protesting against the terms of the Viceroy's decree, and defending, as necessary to prevent fraud, the circular order which had brought the protest from Bolaños; it also offered to present in detail its arguments against the exemption whenever called upon to do so. In view of this, the King ordered the Viceroy, on September 29, 1782, to hear the arguments of the Director of Alcabalas, pass the whole file to the fiscal for his opinion, submit the matter to the *Junta de Real Hacienda*, put into effect whatever should be decided by the latter, and report immediately to the King.<sup>71</sup> Before there was an opportunity for this action to be taken, the various documents leading up to the order of April 24, 1781 were received in Spain and examined by the Council. Upon its advice Gálvez notified the Viceroy that the King had approved in toto the order of April 24, 1781.<sup>72</sup>

In the meantime, in Mexico, the Tribunal had once more protested, in a letter of February 11, 1783, that it was receiving complaints from miners everywhere concerning the circular order of the Director of Alcabalas interpreting the decree of April 24, 1781. Soon after this the new Viceroy, Matías de Gálvez, received the two royal orders cited above. In obedience to them the Viceroy heard the views of the Director of Alcabalas and referred the whole matter to the fiscal of the Royal Treasury. The latter gave his opinion that in general there should be no change in the decree of April 24, 1781, since it had

<sup>71</sup> Gálvez to Mayorga, Sept. 30, 1782, *A.G. Cédulas*, vol. 123, No. 128.

<sup>72</sup> Same to Same, Jan. 13, 1783, *A.G. Cédulas*, vol. 124, No. 4.

subsequently been approved by the King. On January 29, 1785, the *Audiencia Gobernadora* acquiesced in the opinion of the fiscal and then the whole subject was considered by a *Junta de la Real Hacienda* held on March 15th. This meeting revised the earlier order of April 24, 1781, and drew up a new pronouncement concerning the levying of the alcabala on articles related to mining which was even more liberal to the latter than the earlier one. In addition to the exemptions granted before, this provided that all the by-products of mining and the reduction of ore should be entirely free from this tax even though they were not introduced by miners themselves, providing that the purchasers bought them for use and not for resale. The same broad exemption was extended to all mining supplies and virtually all articles brought in to mining centers, whether imported directly by miners or not — providing they were for actual use and not for resale or commerce. This decision was put into effect and notice was sent to the King, with the explanation that the *Junta de Real Hacienda* felt that the Royal Treasury would benefit from the broadest possible exemptions for effects connected with the mining industry.

This victory for the miners was too good to be true. On May 9, 1786, after the views of the Tribunal, the *Dirección de Alcabalas*, the fiscal, and the decision of the *Junta de Real Hacienda* had all been studied by the Royal Council, the King disapproved this broadening of the exemptions and ordered that the Viceroy's order of April 24, 1781, previously approved, should be observed by all parties.<sup>73</sup> This order was received by the Viceroy at the end of August 1786, and sent to the fiscal for the necessary administrative orders; for some reason it was not forwarded to the Tribunal until January 22, 1787.<sup>74</sup>

<sup>73</sup> All the above information is included in the dispatch of Gálvez forwarding this order to the Viceroy, *A.G. Cédulas*, vol. 134, No. 11. The order is also published in Beleña, *Autos Acordados*, II, 293-296.

<sup>74</sup> *A.G. Minería*, vol. 48, expediente 6, No. 3.

We have no further information on this subject for some years. It is probable that with this considerable victory for the miners, and definite orders to the *Dirección de Alcabalas* to respect the King's decision, there was an easing of tension between the two parties to the dispute. On November 26, 1790, Revillagigedo wrote to Spain enclosing a number of documents concerning petitions for a broadening of the exemptions in Guanajuato, and expressing his own opinion that the extension should be granted and made general for all the reals.<sup>75</sup> The reply to this came in a royal order of November 12, 1791, which showed a most liberal spirit and granted exemptions which brought the law back practically to the terms decided on by the *Junta de Real Hacienda* in 1785 and considered too broad by the King in 1786; the Viceroy was, however, cautioned to take measures to prevent fraud as to the true use to which the goods were to be put.<sup>76</sup>

This is the last information we have on this topic and would seem to have settled it effectively. It has been treated at some length because of the vigor with which the provincial mining deputations and the Tribunal fought to protect the interests of the miners, and because at a later time the Tribunal pointed to its efforts in this dispute as one of the accomplishments which justified its existence. It is, perhaps, one of the best examples of the value of the whole organization of the Mining Guild; if the miners had had to depend solely on their own individual protests it is unlikely that they would have gained the hearing which finally won them a victory which must have meant many thousands of pesos to them every year. It is also worthy of note that once the situation had been forcefully brought to their attention, the viceregal government and the crown itself had the wisdom to see that by listening too sympathetically to the laments of the tax gatherers they would run the grave danger of doing great harm to an important industry and

<sup>75</sup> A.G. *Virreyes*, Ser. II, vol. 5/158, No. 179.

<sup>76</sup> A.G. *Cedulas*, vol. 150, No. 142.

thereby threaten the royal income from the quinto. Altogether this topic shows the Tribunal and the provincial deputations in a rather more effective light than was sometimes the case.

Another problem that engaged the attention of the Tribunal from time to time was the supply of quicksilver for the reduction of silver ore. The whole subject of the royal quicksilver monopoly is one which deserves a study of its own. While it was, of course, closely connected with the mining industry, it is beyond the scope of this work, and no attempt has been made even to suggest its importance. There were occasions, however, when the problem of an adequate supply of quicksilver forced itself upon the Tribunal, and it is right that we should give some attention to this topic, considering it as one of the activities of the Tribunal rather than as a discussion of the quicksilver problem.<sup>77</sup>

The interruptions to commerce caused by the war with England subsequent to 1778 caused a shortage of quicksilver in Mexico, the bulk of which came from the mines of Almadén. It will be remembered that quicksilver had been discovered near Cuernavaca, but its extraction had been prohibited because of the fear that it would compete with the royal monopoly. In 1779, the Viceroy Mayorga realized the harm that a continued shortage would do to the mining industry and on November 18th published a decree relaxing the restrictions.<sup>78</sup> This permitted quicksilver mines to be discovered, registered, and worked on the same terms, and under the same laws, as mines of gold and silver, with the provision that after a period of thirty years the mine would revert to the crown upon payment of its fair value; and with the further provision that the product could only be sold to the quicksilver monopoly of the Royal Treasury. This modification of the previous law had

<sup>77</sup> The study by Arthur P. Whitaker, *The Huancavelica Mercury Mine*, Harvard Historical Monographs, XVI (Harvard University Press, 1941), is an important contribution to our knowledge of this subject.

<sup>78</sup> Beleña, *Autos Acordados*, vol. I, 3<sup>a</sup> foliage, p. 108.

apparently been urged for some time by the Tribunal and was received by it with the greatest satisfaction and assurances that it would benefit both the country and the crown by relieving the mining industry of its dependence on an uncertain overseas supply.<sup>79</sup> Nevertheless, the source of supply thus opened up was slow in realizing whatever potentialities it had, and the shortage continued to grow more serious.

On March 29, 1780, the Tribunal wrote the Viceroy that the situation was becoming acute and was forcing a number of mines to shut down. They said that they were doing everything in their power to stimulate exploration for quicksilver deposits and development of those already known, but of necessity it would be some time before native sources could do much to relieve the situation. In the meantime, they understood that there was a considerable surplus of quicksilver in Guatemala. Hence they begged the Viceroy to take the necessary measures to have the president of Guatemala send as much as possible to Mexico at the expense of the Mexican miners.<sup>80</sup> On April 8th the Viceroy replied that, realizing the seriousness of the situation, he had approved the Tribunal's suggestion and sent the necessary orders to the president of Guatemala.<sup>81</sup>

This stopgap did not cause any slackening of the efforts to bring native mines into production. On May 8th Mayorga again wrote the Tribunal, saying that in accordance with a suggestion of the Deputation of Taxco he was authorizing the Tribunal to select a number of well-qualified engineers to supervise immediate development of the mines already denounced, and known deposits. He also reported that he was sending a circular order to all the *Justicias Mayores* of the country instructing them to urge all the Indians in their dis-

<sup>79</sup> Tribunal to Viceroy, Nov. 19, 1799; *A.G. Minería*, vol. 47, expediente 8, No. 5.

<sup>80</sup> *A.G. Minería*, vol. 47, expediente 82, No. 2.

<sup>81</sup> *Ibid.*, No. 3.

tricts to prospect for quicksilver deposits and devote themselves to their exploitation, assuring them that no Spaniard or other person would be permitted to deprive them of their discoveries and that their rights would be vigorously protected.<sup>82</sup> As another step toward the development of the domestic supply, the Tribunal, on May 17th, requested the Viceroy to instruct the proper agencies to undertake the construction of a furnace for the experimental refinement of quicksilver ore, the expenses to be paid by the Tribunal. The Viceroy approved this request on May 22d, notifying the Tribunal that he had given the necessary instructions to the *Contador y Director de las Minas de Azogue de este Reyno*.<sup>83</sup> On May 29th the Tribunal wrote the Viceroy that it had consulted two engineers sent from Almadén to the Superintendent of Quicksilver, and that together they had chosen a site for the furnace in the Bosque de Chapultepec on the south side of the hill, and asked that the necessary orders be given to the alcalde of Chapultepec.<sup>84</sup>

The situation remained acute, however, and the Tribunal continued to cast around for other means of relieving the shortage. On February 21, 1781, the Viceroy approved a suggestion made by the Tribunal that a vessel lying idle in the port of San Blas be sent to Peru to collect quicksilver. He said that he realized fully the gravity of the situation, and had ordered the vessel to sail with a letter to the Visitor-General requesting the quicksilver.<sup>85</sup> During the same year Velásquez de León went to Guanajuato to make a personal investigation for the Viceroy on the distribution of quicksilver in that region; and, at the request of the Tribunal, Mayorga authorized Liceaga to make a personal

<sup>82</sup> *Ibid.*, No. 4; the order to the Justicias is printed in Beleña, *Autos Acordados*, vol. I, 3a folio, p. 108.

<sup>83</sup> *A.G. Mineria*, vol. 47, expediente 8a, No. 7.

<sup>84</sup> *Ibid.*, No. 8. It will be recalled that the expenses involved in building this furnace, as well as in the exploration and development of quicksilver mines, are included as Items 16-28 in the "Account of Extraordinary Expenses" in chap. iii and are discussed on pp. 124-127 of that chapter.

<sup>85</sup> *A.G. Mineria*, vol. 47, expediente 9, No. 2.

examination of the newly discovered deposits at Tepeyopulco.<sup>86</sup> In August the Viceroy made another important concession to encourage the mining of quicksilver. On the 21st of that month he issued a decree which modified that of November 18, 1779, by removing the condition that required quicksilver to be sold exclusively to the Royal Treasury. Henceforth producers of this substance were to be allowed to sell freely to private purchasers, providing that the latter were miners buying directly for their own use. Sale to merchants or resale by miners was prohibited, and the latter were required to register all purchases immediately with the nearest *Justicia Mayor*.<sup>87</sup> Even with these restrictions this was a long step from the days of complete royal monopoly and prohibition of development of the native deposits. In notifying the Tribunal of this decree on the same day, the Viceroy stated categorically that he had been persuaded to take this step by a representation of the Tribunal of July 14th, and inasmuch as they were responsible for the new policy he cautioned them to see that it was not abused by the miners.<sup>88</sup> Hence there is no question that the Tribunal deserves credit for this reform of such potential benefit to the miners — the Tribunal, that is, aided by the critical shortage of quicksilver.

By September Liceaga had made some preliminary examinations of the deposits found at Tepeyopulco, near Cuernavaca, and on the 19th the Viceroy ordered him to send the specimens of ore he had collected to Chapultepec to be refined in order to determine the value of the discovery. At the same time he authorized the Tribunal to go ahead and develop these mines for the account of the Mining Fund, with the understanding that if the crown later wished to take them over it would reimburse the Tribunal for the sums it had expended—provided that the Tribunal now reimbursed the Royal Treasury for what it had already spent in exploring the mines.<sup>89</sup> By the next spring

<sup>86</sup> *Ibid.*, Nos. 6 and 9.

<sup>87</sup> Beleña, *Autos Acordados*, 3<sup>a</sup> foliage, p. 109.

<sup>88</sup> *A.G. Minería*, vol. 47, expediente 9, No. 15.

<sup>89</sup> *Ibid.*, No. 19.



the crown itself had taken an interest in these new mines and on April 8, 1782 Mayorga forwarded the Tribunal a royal order instructing the Superintendent of the Mint to make a survey and report on the quicksilver mines of Tepeyapulco. In order that this official might inform himself of the developments thus far, the Tribunal was ordered to turn over to him all the data which it had collected.<sup>90</sup> On April 26th the Viceroy sent to the Tribunal a number of petitions from miners all over the country begging for quicksilver and asked for its help in meeting the demands.<sup>91</sup> This was the last appeal before the crisis ended; for on May 1, 1782 the Viceroy notified the Tribunal of the arrival in Veracruz of 26,500 quintals of quicksilver from Spain.<sup>92</sup> About the same time a supply arrived from Peru, and on May 11th the Tribunal wrote the Viceroy expressing its gratification and saying that these two arrivals would save the mining industry from the almost certain ruin which had faced it.<sup>93</sup>

Characteristically enough, once the crisis was over, interest in the subject of a domestic supply of quicksilver seems almost to have died out. Instead of pursuing a common purpose the various agencies concerned with this substance fell to bickering with one another. The Tribunal was slow in sending the records requested by the Superintendent of the Mint and received two peremptory orders from the Viceroy to forward them.<sup>94</sup> Then, later in the summer, there was a dispute between the Tribunal and the Treasury. The latter suggested raising the price of the quicksilver which had arrived from Peru and Spain in order to meet the increased costs due to the war. This proposal brought

<sup>90</sup> *Ibid.*, expediente 10, No. 4. It should be mentioned that ever since 1779 Mayorga had kept the crown informed concerning the shortage of quicksilver and the measures taken to develop a native supply: cf. *A.G. Virreyes*, Ser. II, vol. 3/124, No. 156; vol. 4/125, No. 224; vol. 5/126, No. 474; vol. 7/128, No. 1245. It has been thought unnecessary to quote this correspondence as it simply reports the developments here recorded.

<sup>91</sup> *A.G. Minería*, vol. 47, expediente 10, No. 6.

<sup>92</sup> *Ibid.*, No. 9.

<sup>93</sup> *Ibid.*, No. 11.

<sup>94</sup> *Ibid.*, Nos. 8 and 10.

loud protests from the Tribunal and miners generally and both sides carried it to the Viceroy. By quickly offering to make a loan of \$1,000,000 to the crown, the Tribunal won out and the price of quicksilver remained the same.<sup>95</sup> The Treasury was not content with this decision, however, and in 1787 again brought up the project of raising the price, this time making the suggestion directly to the King. The latter, in a dispatch of February 15, 1788, denied the request and ordered that the prices remain unchanged — any losses that the quicksilver administration might suffer to be made up from the product of the quinto.<sup>96</sup>

After this there seems to have been little more interest in quicksilver until the Napoleonic Wars at the turn of the century once more interrupted commerce and brought on a new shortage. We have a number of documents from 1798 to 1803 dealing with this problem, and while the Tribunal appears to have done a good job in keeping track of the needs of the various mining districts and the supplies on hand, there is no evidence that it made any great contribution to solving the crisis. A letter from the Viceroy Azanza, dated July 27, 1798, reported the arrival of one small shipment, but said that when this was exhausted the industry and country would face ruin. He said that with the existing taxes there was very little ore that could be reduced profitably by smelting alone. His solution of the crisis was the dispatch of frequent small shipments of quicksilver on light fast frigates that could elude capture.<sup>97</sup> The situation grew worse and by 1801 there was an almost complete lack of quicksilver and a consequent closing down of many mines.

On February 23, 1801, the Tribunal sent a strong representation to the Viceroy urging the lowering of taxes in order to encourage reduction of ore by smelting. After consulting the Treasury officials, the Viceroy took it upon himself, on January

<sup>95</sup> *A.G. Virreyes*, Ser. II, vol. 10/131, No. 1760; cf. the discussion of this loan in chap. iii.

<sup>96</sup> *A.G. Cédulas*, vol. 139, No. 103.

<sup>97</sup> *A.G. Virreyes*, Ser. II, vol. 1/192, No. 53.

19, 1802, to suspend for seven months collection of half of the diezmo and 1 per cent tax, there being an understanding with the Tribunal that if the King did not approve this action it would make up the loss in taxes from its own Mining Fund.<sup>98</sup> According to the Tribunal, this action saved the situation and in reality made a profit rather than loss for the Treasury because of the amount of silver produced which otherwise would have been left in the ground. Hence, through its representative in Madrid, it begged most earnestly that the Viceroy's action be approved and continued for the duration of the crisis.<sup>99</sup> When he learned about the Viceroy's action, however, the King reprimanded both the Viceroy and the Tribunal, saying that a royal tax could only be suspended by the King himself, and that instead of taking such action they should have notified the King before the situation became critical so that he might have acted. After this reprimand, however, the King did approve the suspension of the tax and said that it should continue until an adequate supply of quicksilver should arrive. He also excused the Tribunal from repaying to the Treasury the amount lost through the uncollected taxes — because of the suffering of the mining industry and the Tribunal's past services to the crown by way of loans and gifts.<sup>100</sup>

By the latter part of 1803 some quicksilver had arrived in Mexico and the situation of the mining industry was beginning to improve. On October 27th Iturrigaray wrote to the Minister Soler that mining was once more beginning to flourish. He said that the quicksilver which had already arrived and been distributed had started a quantity of silver flowing into the Mint, and that much more was already mined and only awaited the mercury to reduce it. He spoke particularly of the flourishing state of Guanajuato, but intimated that all the mining districts

<sup>98</sup> The documents enacting this policy are missing but are referred to in the Royal Cedula of June 25, 1803, cited below.

<sup>99</sup> Representation of Juan Escolano, Madrid, June 18, 1803; *A.I., Sec. 5, Aud. de Méx.*, Leg. 2246, expediente 7.

<sup>100</sup> Soler to Iturrigaray, June 25, 1803, *A.G. Cédulas*, vol. 187, Nos. 162-163.

were in a position to go ahead as fast as the supply of quicksilver permitted. Hence he urged that a particular effort be made in Spain to assure continued and abundant shipments of this substance.<sup>101</sup> As was the case before, once the crisis had passed, interest in quicksilver decreased — or rather the subject ceased to engage the attention of the Tribunal and other officials. It came up again around 1814-15, but these later developments can better be studied in connection with the other related problems of the closing years. This treatment of the subject has shown something of the interest of the Tribunal in the needs of the miners and has exhibited a fairly constructive activity on its part. The weakness, as in so many things, was that while it made an excellent record during the periods of crisis, it did little in between times to prevent their recurrence. Perhaps there was little it could do, but it does seem that at least it should have taken measures during years of abundant supplies to build up emergency reserves for periods of shortage. But before making any judgment on the Tribunal's usefulness in this field, one must remember that its powers were limited and that it could do little more than advise the Superintendent of the quicksilver monopoly on the distribution of the product.

The handling of administrative matters and the protection of the economic interests of the Mining Guild, illustrated in the preceding pages, probably occupied less of the Tribunal's time than the handling of litigation between private parties. In order to provide a bridge between these administrative functions and its judicial duties, this is an appropriate place to present an analysis of all the various types of matters which came before the Tribunal.

We are fortunate in having for the years 1789-1794 periodic

<sup>101</sup> A. G. Virreyes, Ser. II, vol. 2/214, No. 305; a glance at the coinage figures in the appendix will reveal the effect these shortages of quicksilver had on the production of gold and silver.

reports to the Viceroy enclosing lists of the *expedientes* (matters or files) pending before the Tribunal. Since these only exist for the period covered by the administration of Revillagigedo, it is probable that they were furnished at his special request, quite possibly to aid him in the reorganization which was in progress at that time. An analysis of these lists is useful not only because it shows the nature of the subjects which engaged the Tribunal's attention, but because a comparison between the successive lists shows the progress which the latter made in disposing of them. One of these lists is included in the appendix to show in detail the questions which came before the Tribunal.<sup>102</sup> Here we will simply analyze the others by subject groups so as to give a general idea of the matters handled over the five-year period.<sup>103</sup>

The matters which engaged the attention of the Tribunal fell into two general categories which were referred to as *expedientes de oficio* and *expedientes de partes*. The latter included all cases brought by individuals, while the former covered other matters, including almost all those of an economic and administrative nature. In the first few lists these two categories were separated but in the later ones there is no distinction and one can only tell by the title of the expediente itself.

The first list which we have was sent to the Viceroy by the Tribunal on December 24, 1789.<sup>104</sup> It reported a total of 84 matters pending before the Tribunal and *Juzgado de Alzadas*, of which 30 were *de oficio* and 54 *de partes*. Of the former, 11 had to do with the provincial deputations, covering such matters as elections of deputies, questions of jurisdiction, and the erection of new deputations or the extinction of existing ones. The next largest group included seven expedientes on financial matters,

<sup>102</sup> See Appendix B.

<sup>103</sup> For the years 1790 and 1791 these lists were sent quite regularly almost every month; in the later years the interval became longer and more irregular, until there were only two for 1793 and one for 1794. For the purposes of this analysis eight lists covering the whole period have been selected as representative.

<sup>104</sup> *A.G. Minería*, vol. 48, expediente 8, f. 235 ff.

largely connected with the collection of sums due the bank and the shortage in the accounts of the factor. There were three questions dealing with conflicts between the civil and mining authorities, two on the subject of quicksilver, one each on a reduction of taxes, experiments to reduce the cost of refining silver, and on the *juntas* general, and finally three on miscellaneous topics concerning the internal administration of the Tribunal. Among the *expedientes de partes* the largest group (23) was made up of questions involving property in mines, covering denouncements, registries, and disputes between persons over claims. The next group consisted of 14 cases concerned with disputes over money, either arising from the financing of mines, payment of wages, or the collection of debts. Seven cases dealt with disagreements between individuals and provincial deputations, while ten simply involved private litigation on a variety of subjects.

The next list analyzed was that for June 30, 1790.<sup>105</sup> This shows a total of 93 matters pending, of which 45 were left over from the preceding list and 48 were new matters which had come up since that time. Of the 48 new matters, 14 were *de oficio* and 34 *de partes*. Half of the former were concerned with the shortage of the factor, Aniceto del Barrio, four others concerned the deputations; the others covered miscellaneous topics including the proposed gift to the crown. Of the cases brought by individuals, nine concerned property in mines, while eleven grew out of financial disputes. Four had to do with inventions by various individuals of new technical processes or machinery and requests for help in developing them. The remaining five dealt with miscellaneous disputes between individuals and with the deputations.

The next list, dated December 7, 1790, shows a total of 111 expedientes pending.<sup>106</sup> Of these, 50 were new matters, while 61 were left over from the earlier lists, 30 from the first one of

<sup>105</sup> *A.G. Minería*, vol. 48, expediente 9, ff. 440-445.

<sup>106</sup> *Ibid.*, ff. 386-393.

December 1789, and 31 from that of June 1790. Hence, in this half-year period the Tribunal had disposed of 32 old matters, and with 50 new ones, was falling behind. The delay was more noticeable in the cases involving individuals as the old *expedientes de partes* outnumbered the *expedientes de oficio* three to one. The subject matter of the new cases followed very much the pattern of the earlier ones.

The next six months saw a big increase in the business of the Tribunal. The list for June 11, 1791 records a total of 175 expedientes pending, of which 94 had come in since the previous December.<sup>107</sup> Of the 82 matters remaining from former lists, 25 had first appeared in December 1789, 28 in June 1790, and 29 in December 1790. During the next six months the Tribunal made better progress, disposing of 62 old cases, and the list for December 5, 1791 shows a reduction in the total number of expedientes pending to 162.<sup>108</sup> Nevertheless, 112 of these were old cases, six of them going back at least two years to December 1789, while 35 had been in the files for a year or more. The 50 new expedientes in this list are not divided between *oficio* and *partes*, but the subject matter follows the same general division, with fifteen dealing with questions of property and title, ten with the deputations, and six with financial matters, both public and private. Due to the imminence of the opening of the School, there were twelve new expedientes on the subject of education, while the other seven were scattered among as many topics.

The next list, dated March 5, 1792, covered a period of only three months since the previous one.<sup>109</sup> Nevertheless, during this short period the Tribunal disposed of 67 old cases, and with only 35 new ones reduced the total to 130. While the old cases, totaling 95, still formed the bulk of the business, improve-

<sup>107</sup> A.G. *Minería*, vol. 49, expediente 1, Doc. No. 48; this is the list reproduced in Appendix B.

<sup>108</sup> *Ibid.*, No. 4.

<sup>109</sup> A.G. *Minería*, vol. 49, expediente 2, No. 38.

ment was shown, as two-thirds of these had been before the Tribunal for less than a year. The 35 new cases fell into four classifications, eight dealing with financial matters, fifteen with the deputations, seven with individual claims for property, and five with education. This record was not maintained and the list dated June 8, 1793 shows a definite step backward.<sup>110</sup> In spite of the fact that over a year had elapsed since the last report, this list shows that only 31 of the matters before the Tribunal in March 1792 had been disposed of by June 1793.<sup>111</sup> With 99 still pending and 88 new ones, the total had risen to 187. Not only had all these 99 cases been before it for at least a year and three months, but 52 had been in the files for over two years, and of these seventeen had been pending for three years or longer. The new ones followed the familiar pattern. Thirty-two concerned the provincial deputations; twenty dealt with the denouncement and registry of mines and disputes as to property, and twelve with financial matters, mostly between individuals.

The last of these lists, dated April 5, 1794, shows a better record.<sup>112</sup> In the period since June 1793, the Tribunal had disposed of 109 of the old expedientes, leaving 78, which, with the addition of 79 new ones, brought the total to 157. Notwithstanding this improvement, there were still 29 matters pending which had been before the Tribunal for three years or longer. The new material this time was quite diverse, but the major groups remained the same. Twenty-eight expedientes dealt with the provincial deputations and seven with the question of registry of mines and title thereto. Nineteen concerned financial matters, a good many of them having to do with the Mining Fund as a result of the reorganization. Three others had to do with putting the reorganization into effect, while seven con-

<sup>110</sup> *A.G. Minería*, vol. 49, expediente 3, Doc. No. 42.

<sup>111</sup> It is highly probable, of course, that in this year other matters had come before the Tribunal and been disposed of so that they would not appear on this list.

<sup>112</sup> *A.G. Minería*, vol. 49, expediente 4, Doc. No. 17.



cerned technical and scientific matters. The others were scattered between various minor groups.

This concludes the lists of expedientes pending which the Tribunal sent to the Viceroy. The analysis of these sheds light both on the nature of the subjects which engaged the attention of the Tribunal and the speed with which it disposed of them. Five hundred and twenty-eight separate questions appear on the lists analyzed for this period, of which four-fifths fall into three main categories. Questions concerning the provincial deputations led, with a total of 150. While these included disputes between individual miners and their deputations and between the latter and the civil authorities, most of them were administrative matters dealing with local elections, doubts as to procedure or jurisdiction, or similar questions. It is clear from this that while the Tribunal may have failed to consult the provincial deputations on matters of general policy, it did keep in fairly close touch with them on administrative matters. The next largest group of expedientes — 128 in all — dealt with questions of property in mines brought before the Tribunal by individuals. These included both simple cases of denouncement and registry, and questions of disputed ownership, inheritance, and trespass. It is probable that most of these cases ceased to come before the Tribunal after 1793 when it lost its original jurisdiction in contentious cases. Almost as many expedientes (125) involved finances in one form or another. Some of these concerned the accounts of the Tribunal, the collection of debts, and applications for avíos, or other financial aid. The majority, however, arose from disputes between individuals over contracts, payments for services, accounts of agents, and the supply of capital to miners. Other subjects which gave rise to a number of expedientes were scientific or technical experiments and inventions, and education, more specifically the School of Mines. Finally, the fact emerges that the greater part of the Tribunal's business was brought before it by individuals for private purposes. It is probable that this type of business decreased after

1793, but on the other hand it was offset by the appeals which thereafter came to it from the whole district of the Audiencia of Mexico.

These lists do not give a very favorable impression of the speed and efficiency with which the Tribunal dispatched its business. In fact they lend much weight to the charges of delays brought by Pedro de Verazuela in 1793.<sup>113</sup> Of course it should be remembered, as was brought out by the Tribunal at that time, that this was the period when the Tribunal was very short-handed through no fault of its own. With the uncertainty due to the *arreglo*, and the necessity of calling in whichever of the *consultores* was available, it cannot be considered a normal period, and the ministers who composed the Tribunal at that time should not be judged too harshly. And yet, even granting all this, the record is not very impressive, with a considerable number of cases which dragged on for two, three, or even four years. On the other hand, the fact that in general the administrative questions were settled with greater dispatch than those brought to it by individuals lends some weight to the argument of the Tribunal that the delays were often caused by the parties themselves. Then, too, the record of the Tribunal was no worse than that of the government itself in a number of cases we have already studied and in others which we shall see below. But when all is said and done there seems little reason to believe that the establishment of separate jurisdiction for mining cases resulted in any more expeditious handling of mining business than had prevailed prior to 1783.

<sup>113</sup> Cf. below, pp. 278-279.

## CHAPTER VI

### THE HANDLING OF MINING LITIGATION UNDER THE MINING ORDINANCES OF 1783

WHILE THE ADMINISTRATIVE and economic activities of the Tribunal discussed in the last chapter were of great importance, it appears probable that the major part of its time was devoted to handling what was called "contentious jurisdiction." The reader will recall that Lassaga, Valásquez de León, and the others active in the formation of the Tribunal believed that one of the pressing needs of the mining industry, along with more adequate provision for the financing of mines and a better integrated administration, was a more efficient handling of mining litigation. They felt that mining cases were often of such a nature that they demanded a thorough technical knowledge of mining on the part of the judges, and a mode of procedure which would allow them to be settled with greater speed than was possible in the ordinary courts.<sup>1</sup> Hence they sought a system modeled after the Consulado, where all mining cases would be decided by special courts composed of experienced miners. The royal cedula of July 1, 1776, which authorized the erection of the Tribunal and granted it most of the authority which it later exercised under the Ordinances, reserved the grant of "contentious jurisdiction" until the new Ordinances should be formulated and approved. Hence in the years between 1777 and 1783 mining cases continued to be settled as in the past by the royal judges in the mining settlements with appeals going to the Audiencias of Mexico and Guadalajara.

Under the circumstances it was natural that the draft of the Ordinances prepared by the Tribunal should provide for the handling of mining litigation by miners' courts. As we have

<sup>1</sup> Cf. the Representation of Lassaga and Valásquez de León in chap. ii.

seen above in Chapter II, the Tribunal's ideas were considerably modified in the final form and the royal hand was not entirely removed from mining cases.<sup>2</sup> The Ordinances did, however, concede the substance of contentious jurisdiction to the local mining deputations and the Tribunal. The manner in which this jurisdiction was to be exercised has already been outlined and may be studied in detail in the Ordinances themselves.<sup>3</sup> As we shall see below, these provisions were modified by the *arreglo* of 1793 and later orders, but we may now proceed to examine some of the results of this removal of mining jurisdiction from the civil courts, and the placing of it to a large extent in the hands of the miners themselves. In this connection it is necessary to remember that until 1793 the provincial deputations were subject to the Tribunal in administrative and economic matters, but as courts of first instance in handling litigation in their respective districts they were independent of, and on a par with, the Tribunal, their decisions simply being subject to appeal to the respective *Juzgados de Alzadas*.<sup>4</sup>

It was natural that some difficulties and complications should arise in the transfer of jurisdiction from the civil to the mining courts. As far as the hearing of cases in first instance by the provincial deputations was concerned there appears to have been little difficulty since for the most part the local deputations were already established and the change simply meant that they, instead of the royal judges, should hear the suits as they arose. In the matter of the jurisdiction of the Tribunal itself and of appeals from the provincial deputations the transfer was not so

<sup>2</sup> The President of the *Juzgado de Alzadas* of Mexico and Guadalajara was a Judge of the Audiencia, while in the other provinces he was the Corregidor, and later, the Intendant.

<sup>3</sup> Cf. chap. ii, pp. 64-67, and *Ordenanzas de Minería*, Tits. 3 and 4.

<sup>4</sup> The Tribunal at times was inclined to forget this fact and needed reminders from the Viceroy, as when, in 1790, in dismissing a petition of the Tribunal, Ravillagiedo admonished it that "las Diputaciones Territoriales de Minería, de ninguna suerte estan subordinadas a ese Tribunal en los puntos contenciosos de cuia naturaleza es el que se trata. . .," *A.G. Minería*, vol. 48, expediente 9, No. 20, f. 341.

simple. The first junta general held after the Ordinances were received in Mexico raised the question as to just what mining settlements were within a radius of twenty-five leagues of Mexico and hence should take their litigation to the Tribunal in first instance, with appeals going to the court of appeals of Mexico. There also was doubt as to who were to be considered appeals judges in the provinces, according to Art. 13 of Tit. 3. This stated that the presiding judge of appeals in each province should be "el Juez mas autorizado y nombrado por mi, que hubiese en ellas." The *Audiencia Gobernadora* felt that the "nombrado por mi" meant that the judge of appeals in each province should be specially designated by the King and that no one could exercise authority in this capacity without such special appointment.

These two questions were settled temporarily by the audiencia in two orders to the Tribunal of November 20 and December 14, 1784. The first provided that until the district was more clearly defined the Tribunal should only exercise contentious jurisdiction over those reals which were generally known to be within twenty-five leagues of Mexico, and that in doubtful cases any attempt on its part to assume jurisdiction would render its decisions null and void.<sup>5</sup> At the same time the audiencia decreed that appeals should be taken from the local deputations to the audiencia itself as in the past except within the districts of Mexico and Guadalajara, the composition of whose courts of appeal was already described in the Ordinances.<sup>6</sup> This, the audiencia said, was to be done so that the

<sup>5</sup> A.G. *Minería*, vol. 48, expediente 2, No. 24, f. 49. It is interesting that as late as 1790 decisions were being altered as to what reals lay within the twenty-five league radius. On August 5th of that year the Tribunal wrote the Viceroy that its investigations had shown that both Sultepec and Temascaltepec were beyond this radius. In consequence of this the Tribunal had notified these reals that it would no longer hear their cases but that their own *Diputaciones Territoriales* should exercise contentious jurisdiction in first instance, with appeals going to the *Juzgado de Alzadas* of Mexico; A.G. *Minería*, vol. 48, expediente 9, No. 1.

<sup>6</sup> The Viceroy had on December 26, 1783 appointed the *Oydor* Dn. Antonio

miners might be subject to no delays on account of the uncertainty as to who should be appeals judges in the provinces.<sup>7</sup> The Minister of the Indies, José de Gálvez, was informed of this action in a dispatch of the audiencia of April 26, 1785, which also asked that the King make known his will in regard to the appeals judges.<sup>8</sup> In reply to this, on August 12, 1785, Gálvez wrote that the King had decided that until regular appeals judges could be appointed the *Corregidores* or *Alcaldes Mayores* should serve as such so as to save the miners the trouble of taking their appeals to Mexico.<sup>9</sup>

The details of the transfer of jurisdiction were worked out by the Tribunal and the fiscal of the Hacienda under an arrangement which provided that, (1) on September 15, 1786 the audiencia should turn over all cases before it which on April 1st of that year had not been decided or in which the evidence had not been heard, keeping the latter for final disposition; (2) the provisional judges of appeal should associate themselves with two miners and proceed to organize their courts; (3) the said judges should not interfere in any way in the administrative or economic affairs of the mining industry, nor in any cases coming before the mining deputations in first instance, nor do anything to impair the faculties or jurisdiction of the latter.<sup>10</sup> Gálvez was informed of this action in a dispatch of November 29, 1786, and the King approved it in an order of March 20, 1787.<sup>11</sup> While the audiencia acquiesced in this settlement of the matter, it is clear that it was loath to give up its jurisdiction over mining cases. It will be remembered that in 1778, when the Ordinances

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Villarrutia to be the first *Juez de Alzadas* of Mexico. *A. G. Minería*, vol. 48, expediente 1, No. 15, f. 16.

<sup>7</sup> *A. G. Minería*, vol. 48, expediente 2, No. 30, f. 55.

<sup>8</sup> *A. G. Virreyes*, Ser. II, vol. 1/136, No. 415.

<sup>9</sup> *A. G. Cédulas*, vol. 131, No. 246. This order was communicated to the Tribunal on April 1, 1786, with instructions to make it known to the deputations, and acknowledged by the Tribunal on April 8th. *A. G. Minería*, vol. 48, expediente 4, Nos. 3 and 11.

<sup>10</sup> *A. I., Sec. 5, Aud. de Méx.*, Leg. 2241, expediente 20. This also includes summaries of the preceding documents.

<sup>11</sup> *A. G. Cédulas*, vol. 136, No. 132.

were being formed, the audiencia had objected strongly to the grant of contentious jurisdiction to the miners themselves;<sup>12</sup> while this view did not prevail the audiencia had not given up hope, as, in the midst of the above question, on June 26, 1786, it addressed a representation to the King commenting on the new mining Ordinances, pointing out with what efficiency it had handled mining matters in the past, and expressing confidence that the placing of this jurisdiction in other hands was only to meet some extraordinary conditions and a temporary expedient.<sup>13</sup>

With the settlement of these difficulties the transfer of jurisdiction from the civil to the mining courts may be said to have been completed. Of course the provincial deputations and the Tribunal, as well as the courts of appeal of Mexico and Guadalajara, had been hearing cases within their respective spheres since 1784, but the system as prescribed in the Ordinances was now complete.

The question as to how this system worked — whether or not it brought about a marked improvement in the handling of mining cases — is difficult to determine. In this case it would be dangerous to form a judgment from the direct evidence at hand. As has been said, this study is based mainly on the materials available in Mexico City and Spain and even those records are far from inclusive. In the records examined there are thousands of pages concerned with mining litigation, but to base conclusions on even the most thorough study of these would not necessarily give a true picture. Under the system established by the Ordinances the handling of mining cases was decentralized. Except within a limited area the Tribunal had no part in it. The average case was heard, and probably settled, by the local mining deputation; if there was an appeal it went to the court of appeals of that province.<sup>14</sup> Hence the

<sup>12</sup> Cf. chap. ii.

<sup>13</sup> *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2241, expediente No. 21.

<sup>14</sup> Until 1793, when the system was modified.

cases that came to the attention of the Tribunal, except those from its own district, were extraordinary cases where some conflict or doubt had arisen which necessitated an administrative interpretation by the Tribunal or Viceregal Government. At this time it seems safer to draw what conclusions we can from what is in a sense indirect evidence. This includes conflicts of jurisdiction between the mining and civil authorities which came to the attention of the Tribunal or central government and comments by various persons at different times as to the functioning of the courts.

While in the ordinary course of events mining cases seem to have followed the procedure prescribed in the Ordinances, there was occasional variation. Thus in 1791 the Marqués del Apartado and his brother, D. Juan Bautista Fagoaga, denounced an abandoned mine in Sombrerete, at the same time seeking exemption from the quinto for a period of years because of the cost involved in developing the mine. Not only was the advice of the Tribunal sought on the question of exemption, but also on the confirmation of the title to the Fagoagas. The Tribunal heard witnesses as to the length of time the mine had been abandoned and eventually recommended that the Viceroy grant the exemptions and confirm the title.<sup>15</sup> On the other hand we have an example the following year of the opposite procedure — of a case which had come before the central government being sent back to the local mining deputation for settlement. This involved a dispute over the ownership of a mine in Colima. One of the parties had had his title confirmed by Mayorga in 1781 and again by Revillagigedo in 1790 over the protests of the other. The matter had been reported to the King who confirmed the title by discovery as granted by the Viceroy, but said this did not infringe the other party's right to bring action before the local deputation. Upon receipt of this order Revillagigedo notified both parties; the owner then sought unconditional con-

<sup>15</sup> *A.G. Virreyes*, Ser. II, vol. 9/162, No. 596. It is possible that the procedure in this case may have been under Tit. 6, Art. 17.



firmation, while the plaintiff sought the Viceroy's definite acknowledgment of his right to be heard. The Viceroy refused both requests, referring both parties back to their deputation.<sup>16</sup> The King approved this action, but told the Viceroy to inform the civil fiscal of his surprise that the matter had not been sent back to the deputation where it belonged in the first place, instead of taking up the time not only of the Viceroy but the royal ministers. The order ended with a rebuke to the Viceroy, which said, "*y ultimamente por que de todos modos V. E. esta, inivido por los leyes, y novisimas Reales Ordenanzas de conocer en asunto alguno Judicial de Minas.*"<sup>17</sup> This case also illustrated that in some instances at any rate mining cases continued to drag on interminably. Apparently begun in 1781, the suit was remanded to the provincial deputation in 1792 and we do not know when it was finally settled.

There is also record of another similar case in the same year. The owner of a mine in the district of Guadalajara died, leaving it to his widow. A powerful neighboring miner took possession, whereupon she brought suit for recovery in the Audiencia of Guadalajara — before 1783. After the publication of the Ordinances the deputation of Guadalajara claimed jurisdiction over the matter; the audiencia refused to give it up, and it hung undecided between the two courts until 1791 when the widow petitioned the crown directly to have it finally decided by the audiencia where it had begun. On July 3, 1792, the King ordered the Viceroy to take immediate measures to see that the suit was settled promptly.<sup>18</sup> It was not, however; and five years later we find another royal order which said that a second petition had been received from the widow stating that matters stood the same as before, except that she was getting older and poorer, and praying that something be done quickly. This time the King ordered the Viceroy to inform himself of the

<sup>16</sup> A.G. Virreyes, Ser. II, vol. 13/166, No. 232.

<sup>17</sup> A.G. Cédulas, vol. 154, No. 146 (Feb. 20, 1793).

<sup>18</sup> A.G. Cédulas, vol. 152, No. 160.

matter and see that it was returned to the audiencia for immediate decision.<sup>19</sup> This incident does not speak very well for those concerned, as, if the audiencia and deputation had really been interested in speedy justice, the conflict undoubtedly could have been settled. Probably the fact that the usurper was an influential nobleman played some part in the delay.

According to Revillagigedo, there were at this time (1792) many appeals to the Viceroy to settle disputes arising from abuses of their jurisdiction by the local deputations and courts of appeal. While he felt that there was much room for improvement he preferred to ignore most of the disputes, rather than encourage greater numbers or upset the whole system. There was one case, however, in which he felt obliged to intervene — and which he said demonstrated the need for prompt decision in the matter of the pending reorganization. This was a case which arose between the owners of the mines of La Sirena, Guanajuato, and Camargo in Guanajuato, and which had aroused the greatest bitterness and discord among miners of the district and in its deputation. The Viceroy sent a delegate to Guanajuato to inform the parties that the dispute had to be settled immediately.<sup>20</sup> So effective was this intervention that he reported that in one session with his representative the antagonists were able to settle the dispute which otherwise would have dragged on for years. Before the settlement could be put into effect, a representative from Guanajuato appeared in Mexico with the object of nullifying the decision of the Viceroy's agent and returning the matter to the local deputation. When the Viceroy refused to reopen the case the representative appealed to the audiencia to disallow the Viceroy's decree. The dispute then developed in a contest between the Viceroy and the audiencia, with the former appealing to the

<sup>19</sup> *A.G. Cédulas*, vol. 167, No. 170.

<sup>20</sup> Revillagigedo to Gardoqui, May 1, 1792, *A.G. Virreyes*, Ser. II, vol. 12/165, No. 59.

crown to settle the dispute.<sup>21</sup> Gardoqui reported the King's decision in a dispatch of November 8, 1792, which was a stinging reprimand to the Viceroy. It said clearly that the Viceroy had had no right whatsoever to intervene in the affair and that all the actions taken were legally void and of no standing. The independence of the Mining Guild from interference by the Viceroy in matters of contentious jurisdiction is nowhere more clearly stated than in the second paragraph which repeats the reprimand in the following language:

En toda la Ordenanza de Minería de ese Reyno no hay artículo alguno que favorezca a V.E. para la jurisdicción que se adjudicó en esta causa, antes bien el orden con que trata debe procederse en la substancion de todas, y sus respectivos Jueces, y Tribunales en primera instancia, y sus apelaciones hasta executoriarse con el ultimo remedio de la segunda suplicacion ante la R'. Persona, debio convencer a V.E. de su absoluta inivicion para introducirse en tales asuntos de minería y mineros.

After this rebuke the effect was softened somewhat. Inasmuch as the illegal measures which the Viceroy took did result in agreement of the parties, instead of turning the whole affair back to the deputation, he was ordered to take no further action but send the whole expediente to the King for settlement, including the documents bearing on the dispute with the audiencia. He was also to instruct the latter to send its documents on the case; at the same time the audiencia, in consultation with the Viceroy and Tribunal, was to draw up an opinion as to the desirability of permitting a fourth appeal in certain mining cases from the courts of appeal to the audiencia.<sup>22</sup>

<sup>21</sup> The dispute between the Viceroy and Audiencia is best summarized in reports of the former to the crown, i.e., Revillagigedo to Gardoqui, May 1, 1792 and June 30, 1792, *A.G. Virreyes*, Ser. II, vol. 165, Nos. 59 and 116. Revillagigedo to Marqués de Bajamar, June 30, 1792, *A.G. Virreyes*, Ser. II, vol. 168, No. 429.

<sup>22</sup> *A.G. Cédulas*, vol. 153, No. 24. The documents covering the dispute in Guanajuato itself are indeed voluminous, filling the whole of vol. 23 of *A.G. Minería*; some additional ones, as well as many copies, are also in *A.I.*, *Sec. 5, Aud. de Méx.*, Leg. 2244, expedientes Nos. 6, 11, and 15.

This affair is of significance first because of the evidence it presents of the disorderly handling of cases by mining courts, and secondly because of the Viceroy's intervention and subsequent rebuke by the King. This intervention was of importance because it would serve as a precedent to lesser officials — intendants, alcaldes, or *Oficiales Reales* — who might wish to interfere in mining matters for a less worthy cause, and while the King's reply indicated beyond a doubt the irregularity of such interference it is doubtful whether the Viceroy cared to give wide publicity to the order.

While these incidents must not be taken as typical, they serve to show that the administration of justice did not always follow the regular course laid down in the Ordinances. On the other hand it is probable that in nine cases out of ten matters were handled satisfactorily. As is always the case, it was the exception rather than the rule which attracted attention. At any rate, the system established by the Ordinances appears to have been satisfactory to the miners themselves, if one can judge by the complaints and lamentations raised by the provincial deputations and their representatives when the system was changed by the reorganization order of February 5, 1793. In making the representations discussed below, asking suspension of the new order, the deputies said repeatedly that the system established by the Ordinances had worked well and brought great benefit to the miners of the country.<sup>23</sup> Of course, it may be objected that these deputies would naturally oppose measures which curtailed their own powers and would seek to avoid any change; on this score, however, it should be remembered that the deputies were only elected for two years and had no particular personal reasons for giving credit to the administration of justice in the past or worrying about the curtailment of the powers of their successors. Furthermore, as we shall see,

<sup>23</sup> *A.G. Minería*, vol. 95, ff. 375-448 (1793); and *A.I., Sec. 5, Aud. de Méx.*, Leg. 2244, expediente 1, cf. pp. 282-285 below for a more thorough discussion of these documents.

some of the complaints were presented by the whole *junta de electores* of the real concerned. Hence it seems as if some weight should be given to the view that the system had worked out satisfactorily for the miners and afforded them reasonably prompt and efficient justice. At the same time one recalls the indictment of the manner in which justice was administered by the provincial deputations and courts of appeal made by Elhuyar in his *Reflexiones sobre . . . las Diputaciones Territoriales* of 1791 discussed in the preceding chapter, and by other officials in their opinions on the arreglo.<sup>24</sup> The truth may well be that it was a case of the age-old conflict of opinion between those who seek efficiency through authority and those who are willing to sacrifice some of the efficiency for the privilege of running their own affairs.

Before turning to the changes which were made in the handling of mining cases by the arreglo of 1793, it will be worth while considering a serious complaint which was made against the handling of cases by the Tribunal and the court of appeals of Mexico by one Pedro José de Verazuela in 1793, and the Tribunal's justification of itself.<sup>25</sup> Early in February 1793, Verazuela, who described himself as an *aviador de minas*, addressed to the Viceroy a complaint which appears to have grown out of a fancied injustice to himself on the part of the Tribunal. Stating that the main object of the erection of the Tribunal was to give the miners speedy justice at the hands of men experienced in mining, he alleged that the opposite prevailed. He charged that Barroso was the only deputy who attended the Tribunal regularly and that it was impossible to enforce the attendance of the consultores or private miners as substitutes, as they received no salary. Of the four consultores originally elected, only the Marqués del Apartado any longer

<sup>24</sup> Cf. above, pp. 232-233.

<sup>25</sup> The original of this expediente, containing the documents cited below is in *A.G. Minería*, vol. 200, ff. 1-42; a "Testimonio" is in *A.I., Sec. 5, Aud. de Méx.; Leg.* 2238, expediente 81.

resided in Mexico, and he could not give much time to the Tribunal. The result was that most cases were decided by Barroso alone — who was a good man but not a miner — and when he was ill or unavoidably absent either the cases were delayed or decided by persons who would give no study to them and really had no official authority. He said, furthermore, that a similar situation existed in regard to the court of appeals where, due to the lack of associate judges, there were long delays and ill-informed decisions. In support of all this he cited a case of his own where he did appear to have a grievance, although it is hard to judge on his evidence alone. Finally he alleged that the secrecy essential in many cases was broken by sending decrees to the houses of the judges for their signature.

On February 21st the Viceroy sent this complaint to the Tribunal with orders for it to make a reply and send affidavits of its clerks as to the facts alleged. The Tribunal sent copies of the complaint to the clerks for the affidavits required, and to all the judges of the *audiencia* who had served as judges of appeals for their opinions as to the functioning of the latter court and its associate judges. The replies of these judges were not all in until July, but they were unanimous in agreeing that there had been few delays and that the regular associate judges or their substitutes had been at all times prompt, willing, conscientious, and efficient. A number of them said that Vera-zuela's charges were pure invention and that if there had been delays they were due to the litigants themselves.

In the meantime the affidavits of Mariano Buenaventura de Arroyo and Fernando Tamayo, clerks of the Tribunal, were handed in. These admitted that ever since the elections had been suspended in 1786 the Tribunal had been shorthanded, and especially since the death of Liceaga;<sup>26</sup> but said that

<sup>26</sup> Just when Liceaga died is not known, but it must have been sometime during the year 1792, as he was present at the opening of the School on January 1, 1792.

nevertheless its work had been handled promptly and well. While it was true that Barroso was the only deputy, use had been made not only of the *Consultores de Mexico* but of the *Consultores foraneos* who might be in the city and other qualified miners; and the necessity of seeking these persons had occasionally caused brief delays. They swore that no case had ever been heard by less than two judges sitting at a regular verbal hearing. Admitting that the other *Consultores* had left the city, they said that the Marqués del Apartado was regular and faithful in attendance on the Tribunal.

With these documents before it, as well as an opinion of its fiscal, the Tribunal wrote its apologia on August 9, 1793. This began by calling attention to a representation of November 23, 1789, a copy of which was enclosed, which emphasized the desirability of filling the vacancies on the Tribunal. This had pointed out the delays and inconveniences which arose from dependence on the *Consultores* and expressed the fear that these would increase if the vacancies were not filled. Revillagigedo, however, had denied the request the following day because of the expense involved and the pending reorganization. The Tribunal then said that its fears had been to some extent justified, and hence implied very circumspectly that if anyone was to blame it was the Viceroy himself. It continued that Veracruz had exaggerated the situation very greatly, and cited the affidavits of its clerks and the judges of appeal. It repeated that all cases were *heard* by at least two judges and examined by three, and said that considering how shorthanded the Tribunal had been — through no fault of its own — its business had been dispatched promptly. Finally it said that the Tribunal was currently functioning very well, with Elhuyar, Barroso, and the Marqués del Apartado present on administrative and economic matters, and the two latter plus one of the *Consultores* — the Conde de Regla, D. Juan Manuel Guilez, or Juan de Dios Alvarez — on judicial matters. Also it was pointed out that in spite of having been excused from this duty

by the King, Elhuyar had regularly attended the sessions of the court of appeals. Finally, with elections soon to be held under the new *arreglo* they felt that whatever defects might have existed would be remedied. As there are no further documents on this subject, presumably the Viceroy was satisfied by the Tribunal's reply. On the whole it does seem to have justified itself fairly well. It is highly probable that matters did not move as rapidly as they should have, but during the period from 1786 to 1793 the Tribunal did have an excuse by virtue of the vacancies which it was not permitted to fill.

As has been indicated, the *arreglo* order of February 5, 1793,<sup>27</sup> which in effect constituted an amendment to the Ordinances of 1783, modified the system of contentious jurisdiction quite radically. We have already discussed the general features of the reorganization and here will limit ourselves to a study of the consequences of the change in jurisdiction. This change was embodied in paragraph 9 of the order and modified the Ordinances in two respects. First it established the Tribunal as a general court of appeals from the decisions in first instance of all local deputations within the district of the Audiencia of Mexico and granted similar jurisdiction to the court of appeals of Guadalajara for the provinces of Nueva Galicia and Nueva Vizcaya, thus amending Arts. 2 and 13 of Tit. 3 and abolishing the provincial courts of appeal. The court of appeals of Mexico was to continue to hear appeals from the Tribunal; while that of Guadalajara was to hear both primary and secondary appeals — with different judges constituting the court. The second change with this paragraph made was to order that henceforth the *Juez Territorial*, *Juez de Minas*, or *Intendente*, as the case might be, should sit with the two local mining deputies and act as president of the court in all cases of contentious jurisdiction. The net effect of these changes was obviously to lessen the authority of the provincial deputies

<sup>27</sup> *A.G. Cédulas*, vol. 154, No. 105; see above, pp. 205–207, for a summary of this order.



and increase that of the Tribunal and the civil government. Whereas before, the former had been on an equal footing with the Tribunal in matters of contentious jurisdiction, this order specifically stated that henceforth the Tribunal should have the same authority over them in such matters as in the administrative and economic sphere. The Tribunal lost its jurisdiction in first instance, but by becoming a general court of appeals rose in dignity and prestige. Under these circumstances it is not surprising that a storm of protest arose from the provincial deputations.

The royal order of February 5, 1793 was published in Mexico on June 27th and as soon as its terms became known in the provinces the indignation began to make itself heard, although the Viceroy's decree putting it into effect was not published until July 31st. The deputation of Tlapujahua was the first to take action, calling a meeting of all the miners of the district on July 8, 1793. This meeting drew up a strong protest against paragraph 9 of the royal order of February 5th, pointing out the prejudices which would result to the miners, particularly in the more remote districts, and drew up a power of attorney authorizing Don Marcelo de Alvarez to do all possible in their behalf to have the order modified or at least suspended. This power was signed not only by the deputies of Tlapujahua but a large number of the individual miners of the district and embodied a well-reasoned, dignified, but none the less vehement protest.<sup>28</sup>

In the course of the next three months the reals of Zacatecas, Guanajuato, Catorce, San Luis Potosí, Sierra de Piños, Bolaños, Fresnillo, and Guarisimey all followed the example of Tlapujahua and drew up powers of attorney authorizing Marcelo de Alvarez to protest in their behalves and do all in his power to suspend execution of the decree. These powers were all ac-

<sup>28</sup> This document and the others to be cited on this subject are all included in an expediente entitled "Expediente sobre el ejercicio de la jurisdicción contenciosa" contained in *A.G. Minería*, vol. 95, ff. 375-448.

accompanied by the strong protests of the *reals* themselves, but as their arguments were all included in Alvarez's representation in their behalf we need not go into the details of these protests. In most, if not all cases, they were the expression not of the deputies alone but of the whole body of miners, called in special *juntas* to consider what action to take in this crisis, and they granted Alvarez the broadest possible powers, pledging all their goods and possessions as security for any expenses he might incur. These protests and the manner in which so many *reals* joined together in appointing an attorney to represent their interests form one of the most striking occurrences in the whole history of the *Cuerpo de Minería*. In an industry noted for its internal strife and jealousies we suddenly see united and articulate protests against what it considered a grave threat to its independence and welfare.

The reasons which prompted these protests and the arguments of the mining districts against the execution of the order were embodied in a forty-page representation which Alvarez, acting as their attorney, presented to the Viceroy early in October 1793. He said that upon receiving the royal order of February 5, 1793 the mining districts which he represented had been gravely disturbed by paragraph 9 and the effects it would have on the industry. They realized that this order was decided upon after long and careful study, but felt sure that the King's interest in his people would assure a hearing to the most important *reals* of the country. In this connection he pointed out that the Mining Ordinances were also the result of thorough consideration and that one of the bases of these was the provision that mining cases should be decided by miners (the *Diputados de Minería*) and that appeals should be taken to a court in each province, thus assuring the miners prompt and intelligent justice convenient to their homes. This desirable purpose, they felt, would be destroyed by the new provisions. They were convinced that the association of royal judges or intendants with the deputies in first instance would lower the

prestige and authority of the latter, slow up the judicial process because of the many other duties of the royal officials, and fail to improve in any way the quality of justice administered. The abolition of the provincial courts of appeal and centralization of all appeals in Mexico and Guadalajara they considered even more serious. The existing system permitted the prompt determination of appeals by judges who were on the spot, familiar with local conditions, and able to make a personal investigation of the circumstances. These advantages would be lost under the new system. On the other hand there would be numerous grave disadvantages. The first one involved the inconvenience and expense to the miners of having to take their appeals to Mexico or Guadalajara. Furthermore, the miners felt that neither the Tribunal nor the court of appeals of Guadalajara was as well qualified to hear appeals intelligently as were the provincial courts. They said that while the members of the Tribunal might be miners they were not active ones, and, however intelligent, could have no personal knowledge of the circumstances in any given case. For those *reals* whose appeals would go to Guadalajara the situation was worse. Guadalajara was not a mining center and it was, and always would be, extremely difficult to find miners qualified to serve as associate judges of appeal. Hence the miners of such important *reals* as Guanajuato, Zacatecas, San Luis Potosí, and Catorce which now had their own appellate courts, would be forced to travel great distances to present their appeals to inferior judges. Finally Alvarez pointed out that it was misleading to cite the example of the centralized administration of the *Consulado de Comercio*, as commerce was centralized in Mexico while the mining industry was scattered over remote parts of the country. Also the Viceroy was reminded that the idea of taking all appeals to the Tribunal had been included in the original draft of the Ordinances but discarded by Charles III and his ministers as contrary to the best interests of the industry.

In conclusion Alvarez said that his clients were convinced

that the system established by the Ordinances had brought great benefits to them notwithstanding the necessity of becoming accustomed to the changes from the previous order, and begged that these advantages and the experience be not sacrificed. He pointed out that there had been no complaint against the existing system, that this subject had nothing to do with the mishandling of the Mining Fund which had given rise to the reorganization, and that they, the mining centers themselves, had not been consulted in the formation either of the Ordinances or the reorganization. In fact, he held that any failure in the Ordinances or lack of harmony in the Mining Guild had been due to the failure of the Tribunal to consult the mining settlements more freely. Hence Alvarez urged the Viceroy to exercise his discretionary powers and suspend the enforcement of paragraph 9 of the royal order of February 5, 1793, until the King could be informed of the harm it would do to the mining industry, and therefore to the Royal Treasury and the State. He also asked that he be sent the expediente on which the new order was based so that the approaching Junta General might consider it.

On the whole, Alvarez's arguments seem sincere and honest, although there can be little doubt that, while the emphasis was placed on the practical disadvantages, the loss of prestige involved played an important part in the feelings of the provincial deputations. Apart from this, there appears to have been a very genuine conviction that the system established under the Ordinances had been of benefit to the miners; this cannot be ascribed to the self-interest of the deputations because, as has already been pointed out, they served for only two years, and furthermore in many of the districts virtually the whole body of miners joined in the protest.

Strong as were the arguments put forth by Alvarez, they had little effect. The Viceroy referred the petition to the civil fiscal on October 10th, and the latter gave his opinion on January 9, 1794. This said simply that the royal order had been decided

on after great deliberation and had already been promulgated by the Viceroy; in the fiscal's opinion the Viceroy had no authority to suspend it and the only recourse of the miners was to appeal directly to the King. On this same date Alvarez addressed another petition to the Viceroy saying that the Junta General was in session and was interested in discussing the whole subject. Hence he requested all the documents leading up to the order of February 5, 1793. He also suggested that the fiscal of the Hacienda be consulted on the subject as the Treasury would be seriously affected by any prejudice done the mining industry. This petition, together with the original one, was referred to the assessor, who, on January 17th, gave an opinion supporting that of the fiscal; he also said that the expediente on the reorganization in the files in Mexico did not contain all the documents as some of them had gone directly to Spain, and that it was not necessary to consult the fiscal of the Hacienda. On the following day Revillagigedo issued a decree confirming the opinions of the fiscal and assessor, thus in effect dismissing the petition. Alvarez was notified of this decision on January 22d, and promptly requested copies of his representation and the opinions of the fiscal and assessor so that an appeal to the King might be prepared. These two officials had no objection to this and said that it would be all right to turn over all documents subsequent to February 5, 1793 relating to the enforcement of the order. In consequence of the failure of his petition to the Viceroy, Alvarez addressed a representation directly to the crown on May 6, 1794, repeating almost literally the arguments he had used to the Viceroy, and expressing the hope that since the latter had felt he could not act, the King himself would listen sympathetically to the plea. As in all the questions raised concerning the arreglo, by the Viceroy, the Tribunal, and others, the King refused to be moved at least until after it had been given a fair trial.<sup>29</sup>

<sup>29</sup> This representation and the subsequent documents are in *A.I., Sec. 5, Aud. de Méx.*, Leg. 2244, expediente 10; cf. also above, chap. iv.

It is worthy of note that in this whole affair the Tribunal apparently played no active part in supporting the views of the provincial deputations.<sup>30</sup> It is true that at a later time, as we shall see, it objected strongly to the feature of royal judges or intendants sitting with the deputies in first instance. But the abolition of the district courts of appeal and consequent increase of its own jurisdiction gave it a sense of satisfaction that was not offset by the possible prejudice to the *reals* themselves. In fact at the same time it objected to the sitting of royal judges with the deputies, it attempted to increase the centralization still more by urging the abolition of the court of appeals of Guadalajara.<sup>31</sup> This is an instance of that lack of harmony between the Tribunal and the provincial mining centers to which Alvarez referred. It would seem that at times the Tribunal was more interested in its own prestige and authority than in representing the well-being of the miners scattered throughout the country.

During the next few years a number of other questions arose concerning jurisdiction in mining cases, most of them concerned directly or indirectly with the reorganization. The reader will remember that at the end of the order of November 8, 1792, censuring the Viceroy for interfering in the affair of Guanajuato, he was ordered to instruct the *audiencia* to submit its opinion on the advisability of allowing appeals to it from the mining Tribunals in certain mining cases and under certain limitations, this opinion to be prepared with the advice of the Tribunal, the *fiscal* of the Hacienda, and the Viceroy himself. Before anything was done on this score the reorganization order had been received, but the opinion was prepared nevertheless.

While neither the views of the *audiencia* nor those of the

<sup>30</sup> Reference was made by the assessor to a representation of the Tribunal on this subject of July 1793. This has not been found, but it will be remembered that on July 29th the Tribunal wrote Gardoqui expressing its satisfaction with the *arreglo* — although it did have a number of disagreements with the Viceroy; cf. above, chap. iv.

<sup>31</sup> These motions of the Tribunal will be described in detail below.

Viceroy or Tribunal had any effect since the King resolved that there should be no change from the *arreglo*, the opinion of the royal judges does throw some interesting side lights on the actual procedure in mining cases.

In the first place they charged that, while the Ordinances provided that mining cases should be heard orally and written pleas not admitted, this was not the case in practice. They said that in all cases coming before the Tribunal written briefs were submitted, even though they might not be signed, and passed to the assessor — a lawyer — who gave his opinion, after which the clerk drew up a formal statement of the case, which was again submitted to the assessor, and on the basis of his advice the final decree was rendered. From here an appeal went to the court of appeals of Mexico, composed of a judge of the *audiencia* and two miners as associate judges. There the regular practice was for each of the associate judges to submit the documents to a lawyer for his advice, which entailed long delays. Then, if the appeal was admitted, the clerk drew up a statement of the case, which with the documents was passed to the three judges in turn. Again the associate judges consulted their lawyers and on the basis of their advice gave their opinions — which were often actually written for them by the lawyers. The result was that instead of being decided by experienced miners, the cases were in reality decided by a judge of the *audiencia* and two private lawyers. As evidence that this practice was perfectly open and accepted they cited paragraph 10 of the royal order of February 5, 1793, which assigned an annual allowance of a thousand pesos to the associate judges of appeal “por no ser justo sufran de su bolsillo los honorarios de los Abogados a quienes consultan con autos para asegurar su voto en las determinaciones.”<sup>32</sup> Hence the *audiencia* claimed that the miners would receive just as informed and far speedier justice if they brought their appeals direct to the *audiencia* in the first place.

<sup>32</sup> *A.G. Cédulas*, vol. 154, No. 105, f. 10.

Although, as has been said, the efforts of the *audiencia* to increase its own jurisdiction were stillborn, they aroused the fears of the mining interest. Once more it was the provincial deputations that came forward with a protest. This time the same *reals* that had protested against paragraph 9 of the order of February 5th presented a representation directly to the crown, through one Juan Antonio de la Riva, their attorney in Madrid.<sup>33</sup> They said they knew the Tribunal had been consulted and hoped that it had opposed the project. Nevertheless since the Tribunal again had failed to consult the provincial deputations on such an important matter, they felt themselves bound to take this action. Once more they charged that it was this apparent unwillingness of the Tribunal to consult with the *reals* that was responsible for the failure of the former to fulfill the hopes of its creators and had complicated the judicial process established by the Ordinances — which in reality needed no changes whatsoever as shown by nine years of successful operation. The matter was closed by a dispatch from Gardoqui of March 26, 1794, saying that the King had resolved that the order of February 5, 1793, should be faithfully adhered to until experience showed the desirability of some change. Aside from throwing light on the judicial procedure of the Tribunal, the episode illustrates once more the lack of coöperation between this body and the provincial deputations.<sup>34</sup>

Some two years later the Tribunal made one further effort to modify the system of jurisdiction established in paragraph 9 of the *arreglo* order. This was made in consonance with that paragraph of the order of March 26, 1794 which said that the system of jurisdiction established in the Ordinances as amended in 1793 should remain in force until experience should show the desirability of some change, and was embodied in a repre-

<sup>33</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2244, expediente 1.*

<sup>34</sup> The opinions of the *Audiencia*, Viceroy, and miners on this affair are in *A.I., Sec. 5, Aud. de Méx., Leg. 2244, expedientes 1, 3, 4, 5, and A.G. Virreyes, Ser. I, vol. 26, No. 650.* Gardoqui's dispatch of March 26, 1794 is in *A.G. Cédulas, vol. 157, No. 201.*



sentation of the Tribunal to the Viceroy Branciforte dated August 5, 1796.<sup>35</sup> This long document sought two changes in the system of jurisdiction established in 1793: (1) the elimination of the royal judges from hearing cases in first instance in conjunction with the local mining deputations; and (2) the abolition of the court of appeals of Guadalajara, so that all appeals should be taken to the Tribunal in Mexico. While the arguments in favor of these changes are given at great length, they can be summarized fairly briefly. In the first place the Tribunal said that ever since the order of 1793 had gone into effect protests had been pouring in concerning the application of paragraph 9; conflicts between the royal judges and the deputies were continually arising in spite of the efforts of the Viceroy to bring harmony. In view of this situation the Tribunal, on August 2, 1794, had sent a circular order to all the reals asking that they inform the Tribunal of their opinions as to the results obtained from the working of the said paragraph 9. The replies of the reals were unanimous in asking that primary jurisdiction rest with the deputies alone — without the attendance of the royal judges or intendants — as it had before 1793. As to appeals, there was less unanimity; all wished the extinction of the general jurisdiction of the court of appeals of Guadalajara; some desired the reestablishment of the provincial courts of appeal, while many believed that all appeals should go to the Tribunal in Mexico.<sup>36</sup>

Taking up first the question of primary jurisdiction, the representation said that the King's whole object has been to provide speedy justice in the hands of persons familiar with mining. Both these objects were defeated by requiring the royal judges or intendants to sit with the deputies, as in most cases the royal officials had no knowledge of mining and in all cases their other

<sup>35</sup> This representation is in *A.G. Minería*, vol. 95, ff. 125-156.

<sup>36</sup> This is the Tribunal's version of the replies of the reals; the representation says that the replies were attached to it but they were not found with the original or elsewhere.

duties prevented them from giving prompt attention to mining matters, often causing delays that might be disastrous to the parties involved. In cases where the intendant was the royal judge, he either felt superior to the deputies and, not liking the possibility of having his views overruled by them, delegated a lieutenant to sit with them, or himself sat and attempted to dominate the deputies. Due to the great powers and authority of the intendant it was very difficult and even dangerous for the deputies to disagree with him and they were no longer free to decide cases independently on their merits. Furthermore there had been a tendency for the intendants to extend their authority beyond the sphere of judicial matters and interfere with the deputies in their administrative duties. In all this the Tribunal did not wish to cast any aspersions on the character of the intendants, as they had rarely taken an active part themselves, but the *subdelegados* had interfered actively and had presumed to exercise an authority which had caused serious trouble. A number of actual examples of this interference were then cited. The Tribunal concluded this part of its argument by emphasizing once more the desirability of mining jurisdiction being in the hands of miners — just as the merchants and army had their *jurisdicción privativa* — and saying that this could never be realized as long as civil judges were given the opportunity to influence decisions and intervene in matters that were outside their province.

The argument in regard to the courts of appeal was in three parts: (1) concerning the desirability of reëstablishing the provincial courts; (2) the advantages of taking all appeals to the Tribunal; and (3) the reasons for abolishing the court of Guadalajara. The Tribunal admitted that Guanajuato, Zacatecas, and San Luis Potosí would benefit from the reëstablishment of the provincial courts, as they would then have their courts of appeal right at hand. But it contended that there would be no advantage to the other reals which did not happen to be the capital of their provinces. Even though the distances

might not be as great as to Mexico they would still have to leave their homes without enjoying any of the advantages of having their cases heard by the Tribunal. It pointed out that many of the provincial capitals were not mining centers and that often the associate justices — according to law the “substitutes” from the nearest deputation — would have to come long distances to hear the cases. Thus the advantages of convenience supposed to be inherent in the provincial courts were nullified by the distances of the capitals where these courts had to be held from the mining centers. Furthermore, this system would mean the complete domination of these courts of appeal by the intendants who would serve as their presidents, since the miners serving as associate judges would have even less independence than the deputies in first instance. Finally, the intendants would, as before, be prevented by their many other duties from giving prompt attention to mining appeals. For these reasons, while the Tribunal admitted that a few reals would benefit from the reestablishment of the provincial courts, it felt that the great majority of the districts would enjoy no benefits, and it claimed that this was also the view of most of the reals themselves.

The Tribunal then gave three principal reasons why the best solution would be for it to hear all appeals: (1) because the members of the Tribunal were the best qualified by experience, training, and the strict requirements of the Ordinances themselves; (2) their salaries allowed them to devote their whole time to mining cases thus assuring promptness in handling appeals; and (3) they were all of equal standing and hence each one was free to form his own independent judgment, while the fact of their election to the Tribunal showed that they enjoyed the confidence of the miners. There would be the further advantage that in this way the Tribunal would be able to develop a uniform system of procedure and precedents to guide the lower courts for the whole country. It said that the principal objection raised against taking all appeals to Mexico was the distance and inconvenience to the miners. This was answered

by pointing out that Mexico was the capital of the country and the center of its economic life, and that the miners had to come there anyway for the exchange of silver, supplies, funds, and to appear before the Tribunal on administrative and economic matters. Furthermore, most miners had regular attorneys or representatives in Mexico who could handle appeals for them if they were not able to come themselves.

Turning to Guadalajara the Tribunal claimed that none of these advantages existed. It too was distant from the mining centers of its district, but, unlike Mexico, there were no other reasons to take the miners to Guadalajara; there were no persons they could trust to handle their appeals for them and no other business they themselves could do there. Of more importance was the fact that Guadalajara was not a mining center and there were no miners resident in the city or the neighborhood qualified to serve as associate judges — a situation which had existed ever since the court was established in 1784. This fact had been emphasized by the first judge of appeals himself — Don Josef de Moya — in 1786 when he had argued against the wisdom of maintaining an appellate court in Guadalajara. It was further underlined by the last elections of the Junta General in 1794, when the associate judges elected had not been qualified miners under the terms of the Ordinances but only the best available for positions that had to be filled.

The length of time which it took to dispose of the questions raised by this representation was unusual even for the dilatory Spanish procedure. Presented in 1796, the representation did not receive a final answer from the crown until 1803. In the meantime it had passed through the hands of the civil fiscal (several times), the judge of appeals, and the intendant of Guadalajara, the assessor, and two Viceroyes. All of these, except the assessor, opposed both the suggestions of the Tribunal and recommended that no change be made in the existing procedure. On the first proposition they felt that to remove the royal officials from their part in the hearing of cases would les-

sen the authority and prestige of the government. As to the court of appeals of Guadalajara, the general opinion was that it would be more inconvenient to take all appeals to Mexico; and in spite of the fact that Guadalajara was not a mining center, as one official put it, "someone had always been found to serve." Of more interest than the verbose opinions of these officials was the fact that the miners twice renewed their requests for the changes proposed in the representation. In 1797 the Tribunal, in answer to a request for some substantiating documents from the fiscal, sent a second representation to the Viceroy saying that the year which had intervened had only shown more clearly the need for reform. It is noteworthy that the general elections of 1797 had occurred between these two representations and that the second one was signed by the two new deputies. A few years later, on January 27, 1800, the members of the Junta General which was then in session, including those from Guadalajara, voted unanimously that the Tribunal should continue its efforts to bring about the extinction of the court of appeals of Guadalajara and the elimination of the royal judges from the hearing of cases in first instance. Hence it seems clear that in this instance the Tribunal was genuinely representing the desires of the provincial deputations and that the grievance was not a mere passing whim. Notwithstanding this, the final decision of the crown confirmed the earlier determination of the Viceroy Azanza that there should be no change from the system established in 1793.<sup>37</sup>

While its efforts achieved no ultimate success, in this case the Tribunal would seem to have been on fairly solid ground. At least its arguments seem more reasonable than do the rebuttals of the officials to whom they were presented. There can be little doubt that the industry was of one mind concerning the intervention of the royal judges; and the comments of the assessor

<sup>37</sup> Most of the documents on this incident are in *A.G. Minería*, vol. 95, ff. 160-212; the Viceroy's *informe* is in *A.G. Virreyes*, Ser. II, vol. 1/202, No. 122, and the crown's decision in *A.G. Cédulas*, vol. 187, No. 40.

indicate that the Tribunal's charges were not without foundation. Finally the topic we have just studied illustrates once more the conflict between the civil and mining officials and their distrust of one another.

This last phenomenon was clearly evident in a conflict begun between the *subdelegado* of Taxco and the deputation of that district in the year 1795, which also illustrated the manner in which the sphere of influence of the royal officials tended to increase once the initial step of granting them a voice in mining jurisdiction had been taken. This affair began on March 6, 1795, with a letter from the mining deputation of Taxco to the subdelegado quoting a dispatch of the Tribunal of February 25th. This had been to the effect that while royal judges had a right to sit with the deputies in contentious cases, they had no right to take a part in the ordinary procedure of the deputation nor any voice in economic or administrative matters. Specifically it ruled that the act of granting possession of a mine to a new owner was administrative and could be done by one deputy alone.<sup>38</sup> Upon receipt of this the subdelegado wrote to the Viceroy enclosing this letter and saying that in his opinion the Tribunal had greatly exceeded its powers in making such a ruling. He said it was based on a misinterpretation of the order of February 5, 1793, which had clearly intended the royal judges to take part in all judicial processes; the act of giving possession, he claimed, was but the final step in a judicial process and therefore within the jurisdiction of the royal judge. He closed in a rather threatening tone by observing that in his opinion it would be wise for the miners to cultivate the judges rather than antagonize them as the latters' favor might some day stand them in good stead.

Upon receipt of this dispatch the Viceroy referred it to the fiscal of the Hacienda, who on August 5th recommended that an explanation be asked of the Tribunal. In its reply of October

<sup>38</sup> This and the succeeding documents on this affair are in *A.G. Minería*, vol. 200, ff. 281-310.

5th the latter devoted considerable space to a rather fruitless attack on the subdelegado and his views and made only one really constructive point. This was to the effect that in nine cases out of ten, denouncements of mines were not contested and hence the procedure in these cases was simply administrative and did not belong to the sphere of contentious jurisdiction in which alone the royal judges had a right to intervene. This reply, together with the other documents, was sent to the civil fiscal, who, on December 1, 1795, rendered an opinion which held that the Tribunal was completely in the wrong in the whole case. In the first place he said the Tribunal had no right to issue its ruling of February 25th, and in the second place claimed that this embodied a faulty interpretation of the order of February 5, 1793. He denied in toto the arguments of the Tribunal concerning denouncements and gave such a broad interpretation of the order in question as to extend very appreciably the authority of the royal judge and virtually put him on a par with the deputies even in the administrative field. The expediente then went to the assessor who kept it for four years and finally, on November 22, 1800, wrote the Viceroy that in view of the decree of April 20th of that year, cited above, the expediente could be filed away without any further action as the matter had been settled. While in a sense inconclusive, this case demonstrated that the mining deputations had good ground for the fears they expressed in 1793 that the requirement of royal judges hearing cases with the deputies would tend to lessen the latters' influence and authority in all fields.

While we have seen several cases of the civil authorities assuming unwarranted jurisdiction in mining cases, a curious instance arose in 1796 which shows the opposite side of the picture. The guardian of the minor children of Manuel de la Borda wrote the crown that a number of mines belonging to them in Zacatecas had been irregularly denounced and adjudged to one Fermín de Apezechea through the machinations of the deputies and judges of that real. He said that his charges could get no

justice from the deputation of Zacatecas, as the deputies and substitutes were all in league with Apecechea, while the distance, expense, and lack of a suitable attorney prevented them taking the case before the court of appeals of Guadalajara. Therefore he begged that permission be granted for all cases involving the mines of his charges to be taken before the Viceroy in first instance with the right of appeal to the audiencia. If this petition were granted he promised that his charges would contribute to the crown four grains in every marc of silver extracted from their mines for the duration of the war with France. In spite of this offer which amounted to a bribe, the King denied the petition categorically and ordered the litigation kept within the mining courts.<sup>39</sup>

This question of keeping mining litigation within the mining courts was a troublesome one for the King. We have already seen how the Viceroy and audiencia were censured for interfering. In 1802 a very complicated case came to the crown concerning the inheritance of a mine. Begun in 1785 the case had arisen from the fact that two men had in 1781 formed a partnership to operate a mine in Catorce; first one and then the other part-owner had died and the heirs had engaged in litigation to determine their respective shares; there was further complication from outsiders who attempted to get control of the mines from the executors. The *Tribunal de Difuntos*, the *Diputacion de Catorce*, the *Tribunal de Minería*, and finally the audiencia all sought jurisdiction, and when one court would make a settlement another would refuse to recognize it and reopen the case. It dragged on until 1802 when the Tribunal, through its representative in Madrid, presented it to the King with the argument that it was purely a mining case and that jurisdiction belonged only to the deputation of las Catorce with appeal to the proper mining courts, and that the decisions of the audiencia and other courts should be declared void. This case was so complicated that the King made no decision but

<sup>39</sup> A.G. *Cedulas*, vol. 165, No. 193, Nov. 18, 1796.



ordered the Viceroy to investigate and report back to him; after seventeen years in the courts it was still unsettled.<sup>40</sup>

These instances serve to illustrate some of the problems that arose in connection with contentious jurisdiction after 1793. Again, they doubtless represent the exception rather than the rule. Most cases were probably handled more or less in accordance with the procedure laid down in the Ordinances and the royal order of February 5, 1793. But several of these cases, such as that of the heirs of Borda, give us glimpses underneath the surface which indicate that the personal equation was a factor here as in all governmental affairs. Due to the value of the property involved, mining litigation has always aroused violent passions and stimulated resort to devious methods. There seems no reason to believe that the semi-autonomous miners' courts of New Spain did very much to raise the standard of this branch of justice.

This brings to a close our consideration of contentious jurisdiction under the Mining Ordinances, except as it entered into the summary of matters coming before the Tribunal which concluded the preceding chapter. This summary, and the discussion incidental to it, indicated that cases involving contentious jurisdiction formed a high proportion of the matters coming before the Tribunal. It also showed that many cases remained pending for months, or even years, at a time. This evidence, as well as the other data cited, has provided us with a rather oblique approach to the subject. Nevertheless, short of having available fairly complete records of the local mining deputations and the provincial courts of appeal on which to base a thorough investigation, it is believed that from the data presented a moderately accurate idea of the manner in which this jurisdiction functioned can be formed. There was, of course, some confusion at the inauguration of the system; but, once established, it appears to have functioned to the satisfaction of the miners, at least until changed in 1793. On the other hand

<sup>40</sup> *A. G. Cédulas*, vol. 186, No. 79.

it is probable that there were many abuses in practice arising from the personnel administering the system; and also that cases, at least before the Tribunal and courts of appeal, were seldom handled in the summary manner intended by the Ordinances. The instances examined do not tend to show any great speeding up in the judicial process as a result of the transfer of mining cases from the civil to mining courts, although, lacking the records of the everyday cases coming before the provincial courts, this conclusion must be accepted with reserve. There is no question that after 1793 the provincial deputations lost much of the independence they had previously enjoyed, both from the presence of the royal judges in the first instance and from being subject to the Tribunal in judicial matters, as they had formerly been only in the administrative and economic spheres. It also seems probable that the royal judges, subdelegados, and intendants exercised a progressively wider influence in mining affairs than would be indicated by a strict interpretation of paragraph 9 of the royal order of February 5, 1793. This influence was exercised both directly through their gradually taking unto themselves cognizance of matters not strictly belonging to the sphere of contentious jurisdiction, and indirectly through their domination of the mining deputies by virtue of their official position. After 1800, however, complaints of all kinds became less frequent, and it is probable that once they became reconciled to the loss of some of their autonomy the miners were as well served by the new system as they had been by the old.

The two principal arguments advanced in 1774 for the establishment of the Tribunal and the formal organization of the Mining Guild were the need of an agency to finance mines and the desirability of mining litigation being decided by miners' courts. We saw in an earlier chapter that the first object failed to be realized to any great extent. There is no evidence here that mining litigation was handled any more expeditiously or dispassionately by the miners' courts than it had been previously by the civil courts. Whether or not one considers that this

second object of the organization failed as completely as the first, depends on the point of view. Elhuyar held a very low opinion of the justice administered by the provincial deputations. Evidence has been produced to show that there continued to be long delays and that many of the decisions were in reality dictated by lawyers. And yet, as far as we can tell, the miners themselves were satisfied with the system established by the Ordinances and opposed any change. If their satisfaction be the criterion of success, this object of the organization of the Mining Guild was realized.

## CHAPTER VII

### MINING EDUCATION

ONE OF THE most interesting phases of the work of the *Tribunal de Minería* related to its efforts in behalf of mining education and research designed to improve mining and metallurgical technique. It is a popular theory that education in Colonial Spanish America was closely hedged round with the prejudices and limitations of medieval theology and offered little of that broad preparation for life which we deem so essential. In this chapter an attempt will be made to show that, in one channel at least, the educational policy was surprisingly modern, both in its approach to the problem presented and the manner in which it was handled. This subject is not only of interest in itself but is significant because, of all the activities of the Tribunal, it had the most lasting results. The School, or College, of Mines which was established under its auspices and administered as one of its important activities has had its ups and downs, but at the present day continues as the modern Engineering School of the University of Mexico. While the School of Mines is naturally the focus of major interest there were other avenues along which the improvement of mining technique made its way and these also will receive the proper attention.

In their Representation of 1774 proposing the general plan of the Tribunal, Lassaga and Velásquez de León had included recommendations for the establishment of the School of Mines.<sup>1</sup> Emphasizing the need of educating young men in both the theory and practice of mining, they had outlined a general plan which involved the establishment of a School and its maintenance by the Tribunal, with a certain number of endowed scholarships

<sup>1</sup> Cf. above, chap. ii; also Santiago Ramirez, *Datos para la Historia del Colegio de Minería* (Mexico, imp. del gobierno, 1890), pp. 20-28.

and an opportunity for practical experience. It is unnecessary to take up these suggestions in detail, as they were developed more fully in the draft for the Ordinances prepared in 1778, and this in turn was incorporated with little change in the *Ordenanzas de Minería*.<sup>2</sup>

Provision was made for the full maintenance of twenty-five endowed students and the free instruction of any others who would maintain themselves. There were to be secular professors to give instruction in the various theoretical sciences, and masters of the applied arts and mechanics, both groups to be chosen by the director and Tribunal after competitive examinations. In addition to teaching, the professors were to be required to present periodic dissertations on technical subjects of value to the mining industry. The School was to be in the immediate charge of the director under the general supervision of the Tribunal and was to be supported by the Mining Fund. There were to be annual public examinations, and after completing the course in the School the students were to spend three years in practical work in one of the mining centers of the country, before receiving their degree.<sup>3</sup> Thus it can be seen that provision was made for a well-rounded course of theoretical and practical instruction.

In spite of the fact that the early leaders of the Tribunal had seen the urgent need for the School, a number of years passed before the institution was opened. It is true that the Tribunal had purchased a building to house the School, but up to 1790 this was nothing but an unproductive burden on its funds.<sup>4</sup>

<sup>2</sup> *Ordenanzas de Minería*, Tit. 18.

<sup>3</sup> In practice this "internship" was reduced to two years.

<sup>4</sup> On November 16, 1778, the Tribunal entered into a contract with the President of the Hospital belonging to the "Order de Augustinas Descalzos de la Provincia de San Nicolás Tolentino de las Islas Filipinas" providing for the eventual sale of this building to the Tribunal for use as the School. \$35,000 was the price specified, of which \$7000 was to be paid down and the remainder after the sale had been approved by the superiors of the Order, during which interim the Tribunal was to occupy it at an annual rent of \$1200. Cf. Ramirez, *Datos para la Historia del Colegio de Minería*, pp. 37-39, and above, chap. iii. It will be remembered that this transaction was severely criticized during the

Nevertheless the cause of education and technical research was not entirely neglected during these early years. In 1777 the King decided to establish a mining school at Almadén in Spain and on July 14th of that year Gálvez wrote the Viceroy Bucareli instructing him to procure the appointment by the Mining Guild of Mexico of four qualified youths to be sent to Spain at its expense and receive instruction in this school.<sup>5</sup> While there is no evidence as to the number of students sent, Andrés Joseph Rodríguez, who in 1788 was appointed professor of mathematics in the School of Mines, was said to have been one of this group.

The policy of putting the technical knowledge and opportunities of one part of the empire at the disposal of others was not limited to bringing students from the New World to Spain. During the succeeding years a number of royal orders were issued providing for the dispatch of expert miners from Mexico to other parts of the American dominions to give instruction in mining methods. On October 19, 1778 the Viceroy was instructed to have the Tribunal choose two expert engineers to go to Caracas to serve as technical advisers.<sup>6</sup> One was to be qualified in the extraction of ore and the organizing of mine labor and the other in smelting and refining methods. Apparently no action was taken at the time, perhaps due to the death of Bucareli. Some years later the order was repeated,<sup>7</sup> and on September 22, 1787 the Viceroy Flores wrote to Valdés that the Tribunal had chosen two mining engineers, six skilled workmen, two mine carpenters, and four tunnelers, and that these had all been transported to Caracas at the expense of the royal treasury.<sup>8</sup>

On May 29, 1779, Gálvez wrote the Viceroy that the President of Guatemala had notified the King that there were rich

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arreglo, and in fact it seems to have been one of those things done in a burst of initial enthusiasm which served little useful purpose.

<sup>5</sup> *A.G. Reales Cédulas*, vol. 3, No. 160.

<sup>6</sup> *A.G. Cédulas*, vol. 115, no. 74.

<sup>7</sup> *A.G. Cédulas*, vol. 123, No. 92 (Sep. 15, 1782).

<sup>8</sup> *A.G. Virreyes*, Ser. II, vol. 1/142, No. 11.

deposits of gold and silver in that region but a shortage of persons qualified to work them. He ordered the Viceroy to instruct the Mining Guild to send as many trained miners as possible to Guatemala to be placed at the disposition of the President.<sup>9</sup> How many of these miners were chosen or when they went we do not know, but from evidence of a later date it seems certain that they were sent.<sup>10</sup>

Before we turn to the next chapter in this story, which opens with the arrival of Elhuyar, it will be of interest to consider briefly a discourse by one Joseph Coquette de Gallardo on some of the weaknesses of Mexican mining and metallurgical technique. This was dated from the "Cerro de Salitre," in the Real de Pachuca, October 8, 1783, and was addressed to the Viceroy.<sup>11</sup> The writer's principal theme was that, in spite of the fact that Mexico was justly proud of its discoveries and accomplishments in mining, there was much that could be learned from Europe which would bring about the production of more metal at lower costs. In particular he criticized the very general use of the amalgamation method of refining in preference to smelting. He pointed out that in Europe, while the former was known and used, the latter was the more common practice, and European experience showed that for many types of ore it was both cheaper and more efficient. He remarked that in time of war the supply of quicksilver was subject to interruption as had been the case during the recent years. On the other hand the minerals and salts needed in the smelting process could nearly all be found in Mexico if the various deposits were properly explored and worked. Hence he urged a thorough survey of the mining areas of the country with a view to applying or adapting the best European metallurgical technique, and particularly an extension of the use of the smelting method. Gallardo admitted

<sup>9</sup> *A.G. Reales Cédulas*, vol. 116, No. 258. *A.G. Virreyes*, Ser. II, vol. 122, No. 51.

<sup>10</sup> Revillagigedo to Lerena, Dec. 1, 1791, *A.G. Virreyes*, Ser. II, vol. 162, No. 506.

<sup>11</sup> *A.G. Mineria*, vol. 48, ff. 563-572.

that the one great handicap was the shortage of wood for fuel. This he blamed on the carelessness and shortsightedness of the miners of the past and present in stripping the mountainsides in the vicinity of mines of all timber and failing to provide for a future continuing supply. He urged that the government take measures to stop this practice, and that an extensive planting and reforestation policy be adopted.

Gallardo recommended that a fuller use be made of water power to run the various machines and suggested an investigation of the possibility of using windmills. Furthermore he stated that there could be a great improvement in the efficiency of the machinery used through the application of modern inventions and the best European methods.

Turning to the amalgamation method, the value of which he did not minimize, he said that even in this peculiarly Mexican technique there was room for much improvement. He pointed out that an assay of the ore itself would show the best method of treating it — perhaps by the use of special chemicals or by a different mechanical treatment depending on the composition and mineralogical structure of the ore itself.<sup>12</sup> Another more serious fault resulted in the death of many of the laborers employed in refining the ore. Apparently in Pachuca they contracted a form of what is now known as silicosis from the dust caused by pulverizing and sifting the ore before amalgamation. He suggested that research would show ways of avoiding this by using water and carrying on the processes in enclosed troughs instead of in the open. In Guanajuato there was a different agency which caused death — probably by pneumonia. This was the *Ocotes*, or fatwood torches, used for illumination in the mines, whose resinous smoke proved very harmful. Gallardo cited these two instances to show the need of technological improvements and research in various branches of the industry. As the first step in such a program, and as the most necessary measure to improve the mining industry, he recommended that

<sup>12</sup> Elhuyer made this same criticism some years later; cf. Appendix D.



there be a thorough scientific survey of the mines and mining districts of the country, which should cover the extraction of the ore and refining technique, seek to determine the most efficient methods for handling different types of ore, and ascertain where the improvements of European metallurgy could best be applied.

While it is impossible to trace the immediate effect of this memorandum, it is an interesting commentary from a Mexican point of view; and, whether as a result of it or not, the suggestions made were put into effect a few years later with the arrival of Elhuyar and a number of German mining experts in Mexico. We have already mentioned the appointment of Elhuyar as director of the Tribunal,<sup>13</sup> and there can be little doubt that one of the principal reasons for his choice was the desire to have someone in this post who could improve the technical efficiency of Mexican mining and metallurgical methods. To aid Elhuyar

<sup>13</sup> Cf. above, pp. 165-167. On July 18, 1786, the Marqués de Sonora wrote Elhuyar in Vienna notifying him of his appointment as Director of the *Cuerpo de Minería* of New Spain. Elhuyar acknowledged the appointment gratefully in a letter to Sonora dated Sept. 9, 1786. He wrote that if possible he would like to postpone his departure for six months so that he could observe recent developments in mining technique, and especially improvements in the amalgamation process by Baron von Born; he proposed to inspect new mines and refineries in Austria, Bohemia, Saxony, and the Bishopric of Liège, and study some new machinery at Freiburg, and promised to be in Spain by April of the following year. On Oct. 3, 1786, the Marqués de Sonora wrote him granting permission to make these travels, provided he was in Spain and ready to leave for Mexico by the following April. (*A.I., Sec. 5, Aud. de Méx., Leg. 2250.*) Inasmuch as Elhuyar did not arrive in Veracruz until Aug. 1788 he must have been delayed beyond his schedule. It is obvious that with these special preparations, in addition to his previous general training, Elhuyar arrived in Mexico familiar with the latest European developments in mining and metallurgical technique. Arnaiz y Frez, in his essay on Elhuyar (*Revista de historia de America*, No. 6), mentions only two German specialists, Sonneschmidt and Fischer, whom he refers to as "Discher." In addition to engaging these engineers to accompany him to Mexico, Elhuyar was charged with recruiting a similar mission to South America; to head this he selected Baron von Nordenflicht. On this latter mission which is outside the scope of the present study, see Marius, Andre, "Le Baron de Nordenflicht . . . et les mineurs allemands au Pérou," *Revue de l'Amérique latine* VIII (1924), 289-306; and the "Report on the Nordenflicht mission to Peru" in *Revista de la Biblioteca Nacional (Buenos Aires)* II (1940), No. 14, pp. 319-400, and No. 15, pp. 401-429.

and carry out such surveys and experiments as had been recommended by Gallardo, the King also engaged the following German engineers and master craftsmen chosen in Saxony by Elhuyar:<sup>14</sup>

(1) *Mineralogists*

Don Federico Sonneschmidt

Don Francisco Fischer

Don Luis Lindner

(2) *Mining Engineer*

Don Carlos Gotlieb Weinhold

(3) *Master Miners*

Juan Gotfried Vogel

Juan Samuel Suhr

Juan Samuel Schroeder

Carlos Gotlieb Schroeder

Juan Christof Schroeder

Carlos Gotfried Weinhold

Juan Gotfried Adler

The Viceroy was instructed to employ these individuals according to their respective capabilities and to consult with Elhuyar as to what districts they could best serve. The dispatch also made it clear that they were to be paid out of the royal treasury and not that of the Tribunal. As we have already seen, Elhuyar and the German engineers arrived in Veracruz on August 20, 1788, and immediately proceeded to Mexico City.<sup>15</sup> There it took some months for their activities to be planned out and for the various officials to make their decisions. Elhuyar recommended that, inasmuch as it was not practical to give them immediate employment in the capital, they should be assigned residences where they could maintain themselves out of their pay, and that an official notice should be published calling the attention of all miners and mill-owners to their arrival and the object of the King's sending them, in order that the miners and mill-owners could avail themselves of their services and expert

<sup>14</sup> *A.G. Cédulas*, vol. 139, No. 193.

<sup>15</sup> *A.G. Minería*, vol. 48, expediente 7, No. 52, cf. chap. iv.

knowledge. The director suggested, secondly, that all the Germans should be under the direction of, and responsible to, one person who knew their several qualifications and could apply them where most useful, and that all miners wishing their advice should apply to him. He advised that the Tribunal keep them occupied with useful duties and lend the weight of its influence to the results of their investigations and experiments in order that they might become generally known and applied. Finally, Elhuyar proposed that some of them might undertake an examination of the royal copper mine in the district of Valladolid to determine its possibilities for profitable development. He felt, however, that the determination of their permanent residences, or bases, should not await the completion of this task and recommended that these be fixed at Zacatecas, Guanajuato, and Taxco. To the first he suggested the sending of the mineralogist Sonneschmidt and the miners Suhr and Adler; to Guanajuato Fischer and the three Schroeders; and to Taxco, Lindner, the engineer Carlos Gotlieb Weinhold, and the miners Carlos Gotfried Weinhold and Vogel. He felt that with bases at these principal centers they would be in a position to divide their activities over most of the important mining districts of the country.<sup>16</sup> The fiscal endorsed all these proposals and advised further that it would be wise to put the German experts under the direct supervision of Elhuyar as he knew their language and individual qualifications.<sup>17</sup> He, therefore, recommended that the Viceroy issue an order to this effect, instructing them to proceed forthwith to the stations suggested by Elhuyar. He further advised that the Viceroy publish a proclamation in the capital and the provinces calling the attention of all miners to the presence in the country of the German experts and instructing them to apply to Elhuyar for any aid or advice they might need. In this same connection he recommended that the Tribunal be ordered to use its best efforts to find useful occupa-

<sup>16</sup> *A.G. Minería*, vol. 48, expediente No. 7, No. 53, f. 219.

<sup>17</sup> *Ibid.*

tions for the Germans and to inform the public of the benefits to be obtained by taking advantage of their knowledge.

The Viceroy accepted the opinion of the fiscal and sent the corresponding instructions to the Tribunal the same day.<sup>18</sup> Shortly thereafter the Viceroy issued his proclamation in the form suggested by the fiscal and sent copies to the Tribunal for distribution among the various *Reales de Minas*.<sup>19</sup> He also sent a full report of the measures taken to the Ministry in Spain, enclosing copies of Elhuyar's proposals and the fiscal's opinion.<sup>20</sup> These were all approved by the King, and the new Viceroy, Revillagigedo, was instructed to keep him informed of the progress and benefits arising from the employment of these experts.<sup>21</sup>

In the meantime, in Mexico, while official dispatches and decisions moved with their usual slowness, Elhuyar, the scientist and engineer, began his constructive work as promptly as possible. A dispatch to Valdés, dated January 7, 1789, described his activity and that of the German engineers during the preceding weeks.<sup>22</sup> The director reported that owing to illness the Germans had not been able to proceed to their respective posts, until the end of October; but since then they had all taken up their work and were well established.

Likewise owing to illness, Elhuyar himself had not been able to leave for Guanajuato until November 8th, while the summoning of the *Junta de Arreglo* for December 31st, had forced him to cut short his stay there and return to Mexico after only some six weeks. Hence he had been compelled to change the original purpose of his trip which had been to make a detailed study of mining conditions and methods, and, with the help of the German engineers and miners, introduce such improvements as might be possible. Instead, he devoted his limited time in Guanajuato to acquiring a general knowledge of the technique

<sup>18</sup> A.G. *Minería*, vol. 48, expediente 7, No. 53.

<sup>19</sup> A.G. *Minería*, vol. 48, expediente 7, No. 7.

<sup>20</sup> A.G. *Virreyes*, Ser. II, vol. 4/148, No. 667, Flores to Valdés, Nov. 27, 1788.

<sup>21</sup> Valdés to Revillagigedo, Feb. 11, 1790, A.G. *Cedulas*, vol. 145, No. 5.

<sup>22</sup> A.I., *Aud. de Méx.*, Leg. 2241, expediente 11.

and methods followed in Mexico so that he would be able to speak with some local knowledge at the meetings of the junta. In addition to becoming familiar with the methods followed, he wrote that he had seen enough to persuade himself that his own experience and that of the Germans would enable them to suggest numerous improvements in technique and to make sufficient contributions to the progress of the industry to more than justify the expense to which the crown had been put. He had in preparation what might be considered an interim report to serve until he could make a fuller exploration; because of the juntas he had been unable to complete this but promised to forward it by the next post. In the meantime he reported that some experimental assays which he had made in Guanajuato had demonstrated to his own satisfaction that the new amalgamation method developed by the Baron von Born could be applied advantageously to the ores of this district.

Elhuyar stated that while he was making his surveys and experiments in Guanajuato the other members of the German contingent had not been idle. Fischer had coöperated with Elhuyar in Guanajuato and was soon to proceed to Santa Clara de Valladolid to examine the royal copper mine. Sonneschmidt had gone from Zacatecas to Sombrerete at the request of the Marqués del Apartado and his brother, Don Juan Bautista Fagoaga, to examine their mining properties in that real. A number of other mineowners had also requested the services of the German engineers, indicating the interest the latter had aroused and the valuable services they could render. He admitted that this interest was tempered by some doubts and suspicions, but felt that time, experience, and the success of various experiments would overcome these.

In closing, Elhuyar expressed once more his regret that he was forced to remain in Mexico attending the juntas and discharging the purely routine administrative duties of the director. He found the duties of the fiscal, which it will be remembered were in charge of the director, particularly onerous, and begged

once more that the two offices might be separated, so that he might resume his scientific activities and the supervision of the German engineers and miners.<sup>23</sup>

Within three weeks Elhuyar had completed his report on conditions in Guanajuato. This he forwarded to Valdés, together with a covering letter on January 27, 1789.<sup>24</sup> In his letter he warned that the report should not be considered as a full and complete dissertation on the mining industry in Guanajuato, but rather as an exposition of phases of it which he felt were susceptible of improvement and where he felt there was an opportunity for the German experts to apply their knowledge with advantage. In fact, perhaps its primary purpose was to reassure the King that even a brief inspection made it clear that the expense of hiring these Germans would not be in vain but could well be of great profit to the mining industry and the State. He said further that he had expressed his criticisms of the existing technique to no one else, feeling that to do so would only antagonize the natives. He had determined to attempt to correct each defect as the appropriate occasion arose and had impressed on the German engineers the importance of winning the confidence and respect of the natives before attempting to reform their imperfect practices. Finally, he begged Valdés not to conclude from his report that he was a severe and unfavorable critic. The fact that he only mentioned the defects did not mean that he had not seen much to admire and much that he could learn himself from the Mexican technique; rather he had felt that a description of these phases could wait while the important thing was to indicate where there was room for improvement. It is with this understanding then that the report must be read. Even within the limits set by Elhuyar himself, it is a remarkably informative document, and for this reason has been reproduced in

<sup>23</sup> Arnaiz y Frez, *Revista de historia de America*, No. 6, emphasizes the degree to which Elhuyar's administrative responsibility during his years in Mexico forced him to sacrifice the scientific research which he preferred. We shall see, however, that he did not entirely give up research

<sup>24</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2241.*

its entirety.<sup>25</sup> It gives a clear picture of the technical side of the extraction of the ore and its refining as practiced in Guanajuato. It also gives indirectly an interesting picture of the author. Its point of view is dispassionate, scientific, and intensely practical. We feel after reading it that he was a man who knew what he was talking about, was thoroughly conscious of the opportunities before him, as well as the difficulties, and was a shrewd enough judge of human nature to use his knowledge without antagonizing those through whom it must be applied to be effective. Only one further observation on this report appears necessary: it proved beyond a doubt the great benefits that might result from the establishment of a School of Mines and the presence of a body of trained young men in the various mining centers of the country.

Throughout the next year Elhuyar was tied down in Mexico by the administrative work of the Tribunal and the problems of the arreglo. He made repeated efforts to have the office of fiscal separated from that of director and to return to the field to engage in scientific work and supervise the German engineers, but met with no real success until the arrival of the forceful new Viceroy, Revillagigedo.<sup>26</sup>

We have already seen that the latter became impatient with the lack of progress of the *Junta de Arreglo*. Likewise he appears not to have been satisfied that the Germans were earning their salaries by making any substantial contribution to the progress of the mining industry. On December 14, 1789, he addressed a sharp letter to the Tribunal, stating that he had been informed by the intendant of Zacatecas and the *Justicia Mayor* of Taxco that the contingents assigned to those districts had up to the present accomplished nothing.<sup>27</sup> He pointed out that they had had a year in which to learn the language and the nature of their duties, and that there was no excuse for further

<sup>25</sup> Cf. Appendix C.

<sup>26</sup> *A.J., Sec. 5, Aud. de Méx.*, Leg. 2242, expediente 5; *A.G. Cédulas*, vol. 143, No. 196.

<sup>27</sup> *A.G. Minería*, vol. 48, expediente 8, No. 52.

delays. He instructed the Tribunal to inform him what measures were necessary to enable it to stimulate the Germans to immediate activity.

From a letter of Elhuyar of January 14, 1790, perhaps written as a result of this rebuke, it is clear that these charges were not entirely justified. However that may be, Revillagigedo shared Elhuyar's impatience with the *Junta de Arreglo* and apparently agreed that he, Elhuyar, should be in the field observing conditions and directing the German engineers. As a result of his own wishes and the coöperation of the Viceroy in suspending the junta, Elhuyar left for the field in February 1790, for an extended trip.

He proceeded first to Sombrerete, probably to check over the results of Sonneschmidt's examination of the mines of the Marqués del Apartado.<sup>28</sup> In a note to Valdés he reported that he had completed the list of equipment and instruments that would be needed in the School and had sent it to the Tribunal to be presented to the Viceroy.<sup>29</sup> In the meantime the Viceroy renewed his demands for prompt action, and on March 9th wrote Elhuyar asking for a report on the progress of his experiments in smelting and refining methods.<sup>30</sup> The director answered this by a series of dispatches during the spring and summer of 1790, which indicated that his and Sonneschmidt's experiments in applying the Born amalgamation method to the ores of Sombrerete had not been as successful as he had hoped and that it would be necessary to adapt the process to local conditions.<sup>31</sup>

Writing from Guanajuato later in the autumn, he reported that the minerals of that district were very different from those of Sombrerete and adapted themselves readily to the calcination process.<sup>32</sup> He said that the Born method had been applied there

<sup>28</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2241, expediente 11.*

<sup>29</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2242, cf. below, pp. 323-325.*

<sup>30</sup> *A.G. Minería, vol. 49, expediente 9, No. 19.*

<sup>31</sup> Reported in Revillagigedo to López de Lerena, Sept. 26, 1790, *A.G. Virreyes, Ser. II, vol. 5/158, No. 82.*

<sup>32</sup> Elhuyar to Lerena, Nov. 24, 1790, *A.I., Sec. 5, Aud. de Méx., Leg. 2242.*



with great success and only needed minor adaptations in milling practice to assure complete extraction of the silver from the ore. Referring to Sombrerete once more, he reported that Sonneschmidt had been continuing the experiments there and was gradually succeeding in adapting the Born method to local conditions and the particular kind of mineral occurring there, with the confident expectation of attaining that degree of perfection in the refining of the ore for which they had hoped.

During the next few months Elhuyar made some preliminary experiments in refining the copper ores of Michoacán, but was prevented from carrying these very far by lack of the proper equipment. He also continued his efforts to improve the refining of silver in Guanajuato.<sup>33</sup> Writing to Don Pedro Aparici in Spain on April 20, 1791, Elhuyar said that progress had been made toward the complete extraction of the silver from the ore, but that he was not entirely satisfied yet. He said that in Europe the residue could readily be treated by a supplementary process, but that the longer he worked in Mexico the more he was impressed with the necessity of keeping all operations as simple as possible. Hence he was trying to work out some way of reducing the ore to some state which would permit the complete extraction of the silver in one operation. He wrote that Sonneschmidt had been occupied for some time in experimenting with improved methods of treating the medium-grade ores of Sombrerete, in the refining of which there had up to the present been a considerable loss of silver. His endeavors along this line had been eminently successful, with the result that the owners of the mines in which he was working had just turned over to him a new lot of four hundred quintals of ore which had been milled and was about to be refined.<sup>34</sup>

Most of Elhuyar's efforts during the next two years were devoted to launching the School of Mines, to which we will soon

<sup>33</sup> Elhuyar to Revillagigedo, Jan. 12, 1791, *A.G. Minería*, vol. 49, expediente 1, Nos. 24 and 26.

<sup>34</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2239.*

turn our attention. Probably as a result of this we have very little direct information as to the activities of the German engineers and miners during this time. Revillagigedo sent a discouraging report of their accomplishments in a dispatch of October 29, 1791. In this he said that he had sought information from the various districts to which they had been sent and all the reports which he received indicated that they had not been of much advantage thus far and had made little progress. He stated, however, that Elhuyar still had hopes of showing advantageous results, and that he would make a more detailed report soon, after digesting the mass of data which he had received.<sup>35</sup> This report was delayed for two years, apparently because the statements from the officials of the respective districts and various private individuals had been referred to the Tribunal for the opinions of its director, fiscal, and assessor.<sup>36</sup>

On November 20, 1793, the Viceroy wrote to Gardoqui enclosing copies of the original reports from Guanajuato, Taxco, Zacatecas, Sombrerete, and Oaxaca, as well as those of a number of prominent individuals and the opinions which the various officials of the Tribunal had prepared based on the above documents.<sup>37</sup> Unfortunately all these documents are missing and we have only the Viceroy's covering letter. He said that they presented many different facts bearing on the subject and that it was hard to reconcile points of view and conclusions which were diametrically opposed. He took, however, the conclusions of the assessor, Beleña, which were substantially followed by

<sup>35</sup> *A.G. Virreyes*, Ser. II, vol. 9/162, No. 606.

<sup>36</sup> Tribunal to Viceroy, Mar. 12 and 23, 1791, *A.G. Minería*, vol. 49, expediente 3, Nos. 14 and 16.

<sup>37</sup> *A.G. Virreyes*, Ser. II, vol. 17-170, No. 713; the information included in this dispatch was also discussed in more detail in Revillagigedo's *Instrucción Reservada*, Secs. 481-504; this presents, if anything, an even more unfavorable picture of the Germans' accomplishments. He summarized the question by saying that in his opinion the Germans had possessed a theoretical knowledge vastly superior to that of any of the native miners, but that it was necessary to adapt this to the local conditions and established practices of the country as well as to the native workers and a different scale of prices—all of which would take time, tact, and long experimentation.

the Tribunal and the *Junta Superior de Real Hacienda*, as the truest statement of the progress of the German engineers and their usefulness up to date. According to this their contributions were limited to some improvements in mine carpentry and timbering made by Suhr, some useful changes in the construction and use of implements and tools, and the development of a machine called a "tambor" or drum, for ventilating mines that would otherwise be unworkable.<sup>38</sup> He said nothing had been done to improve the interior development and workings of the mines, which was one of the phases most needing attention. While much attention had been devoted to trying to improve the local methods of refining ore, it was the consensus of opinion that the local methods had proved themselves superior to the ones practiced by Elhuyar and the German mineralogists, at least under the conditions existing in most of the districts of the country. Nevertheless, he warned that it would not be fair to form a final judgment until the conclusion of the experiments currently being carried on. In general the

<sup>38</sup> The value of this "tambor," or drum, was illustrated in one of the most amusing stories encountered in all this study. It is recounted as follows in the *Gaceta de México* for Apr. 3, 1792 (vol. V, No. 7, p. 57): "En el Pueblo de Zolaga de esta Intendencia de Oaxaca, en Jurisdiccion de Villa-alta, se halla una mina nombrada 'La Hedionda', que se ignora quien fue su primer dueno, y solo por noticias de unos a otros se dice ser rica; que un Sacerdote la habia maldecido, desde cuyo tiempo despedia un hedor tan pestifero que obligo a abandonarla; y que aun los paxaros que pasaban por encima se caian muertos. En estos tiempos han intentado muchos trabajarla, y en inventar medios para quitarle el hedor se han gastado mas de cien mil pesos, abriendole como catorce bocas y algunas socabones; pero en llegando a cierta hondura han parado movidos del dicho obstaculo: con lo cual tambien se destruyo su Hacienda, existiendo solo una tarjea que se consruyo a mucho costo. Por el mes de Febrero del año pasado mando Don Diego de Villasante a reconocerla a el Alemán D. Carlos Weinhold, Facultativo por S.M. quien habiendola visto y asegurando la quitarla el hedor, obligo a Villasante a denunciarla, y a solicitar Habilitador, como lo hizo; y se comenzo a trabajar dandole dos socabones uno al Oriente, donde estaban un pozo hediondo, y otro al Poniente, donde se hallaba otro, por cuyo medio corre un rio. Siguiendo los socabones, y puestro un tambor por el expresado Alemán para introducir el viento, con la caida del agua; y habiendose barrenado, y practicado otras maniebras al intento, se han conseguido dexar las bocas y labores libres del hedor, y expeditas para trabajarse sin impedimiento, como ofrecio dicho Alemán."

inference was that the work to date had been without any great benefit to the miners of the country, had been a considerable burden on the individual miners whose mines and ore had been used in the experiments, and had cost the Treasury \$45,371 in the wages, maintenance, and transportation of the Germans.

While there is no reason to doubt the sincerity of this report, allowance should be made for the fact that the data was for the most part supplied by natives, in some cases officials who were not miners, who would have a natural tendency to view these foreign experts with distrust. Even the learned Gamboa had felt that Mexican mining methods were the best in the world and that there was little to be learned in a school or from foreigners; hence it would not be surprising to find this same attitude held even more strongly by persons of lesser education. Furthermore the lack of accomplishment may well have been due to halfhearted coöperation on the part of the Mexicans. In his first report of 1789, Elhuyar had commented on the ignorance and prejudices of most of the miners and had predicted that the introduction of reforms would be a long, slow process. On the other hand, it is a familiar occurrence for the trained technician to have to undergo the painful process of adapting his superior theories to the practical realities of the local situation. While we may discount some of the unfavorable implications of this report, it is probably true that the German experts had to learn certain practical lessons before they could produce results of real value to the Mexican mining industry.

We have little more knowledge of the German engineers until the year 1800 when their ten-year contracts had expired. On February 27, 1800 the Viceroy Azanza wrote a long dispatch discussing their future status, pay, pensions, and return to Europe.<sup>39</sup> Most of this is devoted to a rather detailed discussion of the adjustment of pay and pensions, but it contains some information of interest. Of all the Germans who had come to

<sup>39</sup> *A.G. Virreyes*, Ser. II, vol. 8/199, No. 782.

the country in 1789, only the engineer Sonneschmidt and the miner Carlos Gotlieb Schroeder wished to return to Europe; and the Viceroy recommended that they be furnished their transportation back to Europe and pensions at a figure to be determined by the King. The two engineers Fischer and Lindner were staying in Mexico at their own request. The former was continuing work in refining copper in Michoacán which had been authorized by the King, and his salary had been continued. Lindner was at the time serving as acting professor of chemistry in the School of Mines, and the Viceroy recommended that this appointment be made permanent since he was doing a first-rate job. The Viceroy also reported that he had granted permission to the three miners Juan Samuel Suhr, Juan Gotfried Adler, and Carlos Gotfried Weinhold to remain in Mexico, inasmuch as they, like the two above, had become Catholics and had married. He felt they could continue to be of some use to the mining industry and left the question of pensions up to the King. The others had all died since 1790. The report stated that the German mission on the whole had been a disappointment since it had not made any significant contribution to either mining or refining. Even Sonneschmidt himself was finally convinced that the native methods of refining ore were preferable to the European ones under local conditions. This, the Viceroy added, did not mean that they had not done their best and made some useful innovations — such as improvements in timbering and mine ventilation. The King replied to this report through his Minister Soler on April 28, 1801, approving the recommendations of the Viceroy, and the latter in turn reported a year later that they had been carried out.<sup>40</sup>

This brings to a close our study of the German mining mission. From the comments which we have observed, it was clearly a disappointment from the point of view of positive results. Lacking the detailed reports from the various centers as to their work, it is not fair to reach too definite conclusions,

<sup>40</sup> *A.G. Cédulas*, vol. 179, No. 58; *Virreyes*, Ser. II, vol. 7/208, No. 600.

but there seems to be no question that local conditions did not adapt themselves readily to the latest European technique. This does not mean, however, that we should consider the mission a complete failure. In the first place the very fact that it was sent at all is most interesting as an evidence of the modern outlook of the Spanish administration and its interest in the economic welfare of the American colonies.<sup>41</sup> Then, too, the presence of this body of trained engineers and miners was of the greatest possible assistance to Elhuyar in getting information concerning the problems of the mining industry and conditions in different parts of the country. This in turn allowed him to organize the work of the School and of his branch of the Tribunal in a more intelligent way and formulate a reasonable combination of the most modern scientific theory and European technique with the realities of local conditions. Finally the presence of these foreign experts undoubtedly gave a stimulus to the native mineowners and engineers to conduct their own methods more efficiently.

Having disposed of the collateral development in the field of mining education and technical progress, we may now turn to the central feature — the School of Mines itself. The fact that up to 1786 no steps had been taken toward the establishment of this institution undoubtedly had a good deal to do with the choice of Elhuyar as the second director of the Tribunal; and in the various orders concerning the reorganization of the Tribunal the desirability of the prompt opening of the School was emphasized. The government in Spain seems to have felt that this would be accomplished soon after Elhuyar's arrival, since, on April 18, 1788, even before the latter had left for Mexico, a royal order was issued instructing Don Andrés José Rodríguez to proceed as soon as possible to Mexico at the

<sup>41</sup> Undoubtedly the hope of adding more gold and silver to the Spanish Treasury played a large part in this solicitude for the Mexican mining industry, but this does not lessen the credit which should be given the method adopted to attain this end.

crown's expense, there to present himself to Elhuyar for appointment to the chair of mathematics in the School.<sup>42</sup>

In spite of these expectations and repeated demands on the Tribunal by the Viceroy that it hasten the opening of the School, this did not come about until about 1792.<sup>43</sup> The delay was probably inevitable. The new director had to familiarize himself with the whole situation and make many preliminary arrangements; these in turn had to be approved by the Tribunal and the Viceroy. Furthermore, as we have seen, Elhuyar spent considerable time in the field, although much of this was while he was awaiting action by the Tribunal.

Soon after his return from his first hurried trip to Guajuato late in 1788, Elhuyar requested the Tribunal to turn over to him all papers bearing on the subject of the School that might have been prepared by Velásquez de León, in order that he might have this assistance in drawing up a detailed plan.<sup>44</sup> To this request the Tribunal replied that it was ready to coöper-

<sup>42</sup> *A.G. Cédulas*, vol. 139, No. 205; Rodríguez was referred to as one of those who had been sent to Spain from Mexico pursuant to the Royal Order of July 14, 1777. (*Cédulas*, vol. III, No. 160) This appointment of Rodríguez caused a long dispute between the Treasury officials and the Tribunal over the payment of his salary. The order appointing him said the Treasury should pay the expenses of his trip to Mexico, but failed to make clear who should pay his salary once he got there. The Treasury said this was an obligation of the Tribunal, while the latter objected to paying Rodríguez before it had approved his appointment or before there was anything for him to do in the School. While the dispute dragged on through into 1789, Rodríguez came near starving and repeatedly implored the Viceroy to settle the question. Finally in March 1789, the Tribunal gave in and agreed to pay him. In April Elhuyar recommended that he be given charge of the first-year course in the School when it opened, and this proposal was subsequently approved by the Tribunal and the Viceroy. The whole controversy was one of those petty squabbles all too frequent between different branches of the Spanish bureaucracy. The documents on the subject are in *A.G. Minería*, vol. 48, expedientes 7 and 8, and *A.I., Sec. 5, Aud. de Méx.*, Leg. 2238; Ramirez, *Datos para la Historia del Colegio de Minería*, pp. 57-60 also describes the affair.

<sup>43</sup> Several of the Viceroy's dispatches to the Tribunal concerning the Rodríguez controversy ordered it to bestir itself in regard to the School; e.g., Viceroy to Tribunal, Oct. 25, 1788, *A.G. Minería*, vol. 48, expediente 7, No. 5; same to same, Dec. 29, 1788, *ibid.*, No. 22; and same to same, Feb. 23, 1789, *ibid.*, expediente 8, No. 24.

<sup>44</sup> Elhuyar to Tribunal, Jan. 12, 1789, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2238.

ate to the fullest extent, but that there were no documents in its files bearing on the organization of the School.<sup>45</sup> Hence Elhuyar had to formulate the whole detailed plan himself. He presented a preliminary draft of this to the Tribunal in April 1789. The latter considered it and discussed it with the director for some time and eventually returned it to him with instructions to put it in final form.<sup>46</sup> The final draft was presented to the Tribunal for its formal approval on January 12, 1790,<sup>47</sup> and, having already examined it, the Tribunal approved it quickly and on January 22d sent it to the Viceroy.<sup>48</sup>

The plan as drawn by Elhuyar is so significant in any study of the School of Mines and of such interest in itself as an educational document that it is reproduced in translation in the appendix.<sup>49</sup> Hence we need summarize only the broad outlines here. From the educational point of view, the plan seems very complete for the period, offering, in Article I, a well-integrated program of technical instruction, combining up-to-date theory with practical experience in the field. It also provided for adequate laboratory equipment and hence recognized the desirability of experimentation as well as direct instruction in scientific education. The second section dealt with the qualifications of the students and made provision for general students as well as the endowed scholars. The estimated cost of maintaining the students, the list of clothing, and other details of the internal economy are interesting from a social point of view. If the section on administration provided a regime which seems rather strict from the criterion of the modern college student, it should be remembered that these boys were to be from fifteen to twenty years of age. While the daily schedule

<sup>45</sup> Ramirez, *Datos para la Historia*, p. 59.

<sup>46</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2238.

<sup>47</sup> I have been unable to find the original of this document; a certified copy, however, appears in *A.I., Sec. 5, Aud. de Méx.*, Leg. 2238, expediente 41; cf. also Ramirez, pp. 51-73.

<sup>48</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2238.

<sup>49</sup> See Appendix D.



of work laid out in Article 4 was strict, it did not fail to afford adequate time for recreation and relaxation. In this connection, it should be noticed that a four-year course was planned, with no regular vacations other than the numerous *días de fiesta*; and, except for the variable period to be spent in field-work in one of the near-by mining districts, one year was to run directly into another. Thus it was a strenuous course as well as one designed to produce practical results. Finally there was a great deal of reason and common sense in the final part where Elhuyar outlined his ideas for the progressive establishment of different classes.

When the Viceroy received this plan from the Tribunal, he referred it as usual to the fiscal. The latter rendered his opinion on February 5th; <sup>50</sup> recognizing the desirability of the early establishment of the School, he recommended provisional approval of the plan, with one exception. The fiscal held that since Art. 2, Tit. 18, of the Ordinances provided for twenty-five endowed students, the School should not begin with less than that number, pointing out that some would resign, become sick, or fall out for other causes. Thus, because of rather legalistic reasoning, he discarded Elhuyar's careful plan that within two years would have provided for balanced classes and a regular number of new students every year. The Viceroy confirmed the fiscal's opinion on February 6th, and communicated his approval of the plan on these terms to the Tribunal on February 12th.<sup>51</sup> At the same time he instructed it to open the School as soon as possible and in the meantime to perfect the organization and make arrangements for procuring books and equipment from Europe.<sup>52</sup> On February 20, 1790, Elhuyar left for Sombrerete and spent the next year and a half conducting experiments there and in Guanajuato, not returning to Mexico until the middle of June 1791. The fact that during

<sup>50</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2238, expediente 41.*

<sup>51</sup> *Ibid.*

<sup>52</sup> *A.G. Minería, vol. 48, expediente 9, No. 26.*

this time virtually no progress was made toward opening the School is an indication of the extent to which the Tribunal depended on Elhuyar for leadership in these matters. This delay, however, gives us an opportunity to pursue a theme which was directly related to the School and of considerable interest in itself, namely, the process of collecting the necessary equipment and instruments for the School.

In accordance with the instructions of the Viceroy in his dispatch of February 12, 1790, the Tribunal on February 15th requested Elhuyar to draw up a list of the instruments and equipment necessary for the School.<sup>53</sup> The director was unable to do this before his departure, but on March 24th sent to the Tribunal the list of instruments he deemed necessary together with a covering letter of explanation.<sup>54</sup> He said that the list began with the apparatus and instruments necessary for the course in experimental physics and was followed by a list of the chemistry equipment and of various substances necessary in the study of chemistry and not to be found readily in Mexico. He also said that although it was not included in the list he considered of utmost importance the provision of a mineral collection, inasmuch as it would take a long time to form this in Mexico and even then it probably would not be complete, while a complete collection could be readily obtained in Europe. Hence he requested that this be ordered immediately, the samples not to be show pieces, but chosen for their suitability for study, at least four or six inches square, and marked with their place of origin. In order that each student might be equipped with the proper instruments both for the field work and the courses in the College, Elhuyar requested that the Tribunal order immediately fifty cases of mathematical drawing instruments, fifty cases of instruments for subterranean geometry, fifty-five assay balances, fifty ordinary

<sup>53</sup> Ramirez, *Datos para la Historia* p. 74.

<sup>54</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2238*, expediente 41; see Appendix E for the complete list of equipment finally ordered.

balances for weighing metal to be assayed, and fifty sets of assay weights. He also said that until the professors in the various courses could formulate their own textbooks it would be necessary to use European texts in the different courses. He confessed that he did not know any satisfactory Spanish ones for the advanced courses, but said that while efforts were being made to find these the *Compendium of Mathematics* by Don Benito Bails could serve for the first course, and hence he requested that a hundred copies of this be ordered. All these articles, he said, should be added to the accompanying list. As to the cost, he could give no definite figure, but recommended that the Tribunal forward \$15,000 to Don Antonio Valdez, in care of the Five Guilds of Madrid.

With this list a start was made in procuring the apparatus and instruments necessary to put the School on a sound scientific basis. The process took over ten years, and even by 1803 all the equipment ordered had not been received. While the Tribunal forwarded the list to the Viceroy fairly promptly and made arrangements for paying for the instruments, nothing was done about the list for nearly three years. In January 1793, the Council of the Indies commissioned a Spanish official residing in London to buy the equipment. The process of accumulating it continued for many years. The persons entrusted with the task decided that much of the list was obsolete in view of recent technical advances and should be revised, and many of the instruments had to be specially constructed. The first shipment, however, was made reasonably soon, clearing for Cadiz on January 3, 1794, and arriving in Veracruz the following November. Further delays followed, occasioned by the necessity of designing and making the apparatus and the failure of the brokers who were handling the shipments, and by August 1796 only forty-five out of one hundred and eighty-two items had been shipped.

These delays naturally brought protests from the Tribunal. Beginning in 1793 a series of dispatches urged speed and

pointed out the difficulties under which the professors at the School were laboring in trying to conduct their courses without proper equipment. The only result of these was a list from the agent in England dated August 13, 1796, showing the status of the order and the estimated cost of each article.<sup>55</sup> This list is interesting as an indication of the development of physics instruments at that time and especially for the amount of electrical equipment included. During the succeeding years the interruptions to commerce incident to the Napoleonic Wars created further delays. In 1797 several shipments were made between England and Spain in vessels flying the flag of the United States, and a little later it was necessary to arrange transfers through Hamburg. Nevertheless, it appears that by 1798 most of the equipment had been shipped, although some was held up until 1803.<sup>56</sup> Although during the early years the School was handicapped by all the delays, it was eventually furnished with the most up-to-date scientific equipment of the day, much of it specially constructed by the best artisans in Europe. It is doubtful whether any other school in America was so well equipped technically for scientific education at the time or for a good many years to follow.

Elhuyar returned from Guanajuato and Sombrerete on June 18, 1791, and preparations for opening the School were promptly resumed. There were many problems to be worked out: the preparation of suitable quarters, provision for professors and the necessary administrative staff, and the selection of the first students; to all of these Elhuyar devoted himself during the ensuing months.

<sup>55</sup> See Appendix E.

<sup>56</sup> The history of the accumulation of these instruments is recorded in a voluminous collection of documents. The principal source is a bundle entitled "Expediente sobre arreglo del Colegio de Minería y envío de instrumentos, maquinas, y utensilos para el, 1790-1803," *A.I., Sec. 5, Aud. de Méx., Leg. 2247, expediente 11*. Other documents are found in *loc. cit.*, *Leg. 2238, expediente 41*; *A. G. Minería*, vol. 49, expediente 1, and expediente 4, and *A.G. Cédulas*, vol. 157, No. 65.

Immediately after his return, the Tribunal brought to the director's attention the necessity of making provision for housing the School and making repairs to the building which had been rented in 1778. After a careful inspection of the latter, Elhuyar wrote the Tribunal on July 14 that it was not at all suitable for the School and that heavy expense would be entailed if the necessary repairs were made. He also said that it would be almost impossible and very expensive to find another, and that it would be much better for the Tribunal to own its own building — preferably to build one according to a suitable design. He said that there was a piece of land available at the corner of the Calle de Santa Teresa and the 2<sup>a</sup> Calle del Indio Triste which was well situated and could be bought for very little, and he recommended that this be done. In the meantime he stated that the School could open in the building already rented, since at first it would need space for only the first classes and had as yet nothing to fill a library or laboratories. On August 12th the Tribunal approved Elhuyar's idea of purchasing a piece of property and erecting a building and the Viceroy ratified the decision on the 20th. In November Elhuyar wrote that this piece of property was no longer available and instead proposed one belonging to the Academy of San Carlos in the Calle de Nilpantongo and asked that he be given authority to draw up preliminary plans for the building so as to be ready when the King's approval of the purchase should be received. These suggestions were also approved by the Tribunal and Viceroy.<sup>57</sup>

In the meantime the director had also been occupied with the question of professors. It will be remembered that Don Andrés José Rodríguez had already been appointed to preside over the first-year course in mathematics. On July 7th Elhuyar wrote the Viceroy outlining the qualifications which the other professors should have, and on the same day the Tribunal pointed out the difficulties of abiding by Art. 10, Tit. 18, of the

<sup>57</sup> Ramirez, *Datos para la Historia*, pp. 77-86, *passim*.

Ordinances — regarding competitive examinations — if these professors were to come from Spain. Notwithstanding this, the director wrote on September 3d, proposing that professors for the three more advanced courses be sought directly in Spain. In this connection he pointed out that in 1786 two royal pensioners had gone to the School of Metallurgy in Chemnitz after studying mathematics, chemistry, and physics in Paris and that in 1788 four more had been sent to the same school. He said that he had learned that the first two had concluded their studies and had traveled to the mining centers of Austria, Bohemia, Saxony, Hanover, and England, and were qualified to teach. A few weeks later he wrote the Viceroy proposing that Don Francisco Antonio Bataller, son of the Oydor Don Miguel Bataller and former professor of physics in the Colegio of San Isidro in Madrid, be appointed professor for the second-year course, that is, physics. These matters were referred to the fiscal who on October 24th recommended that the director's suggestions be approved, which was done by the Viceroy on October 29th, subject to the confirmation by the King.<sup>58</sup>

Word of Elhuyar's proposal seems to have spread, as two Mexicans applied for posts as professors, pointing out their qualifications, sending copies of mining studies they had written, and objecting to the appointment of Spaniards when there were qualified natives available. Their pretensions were turned over to Elhuyar who found their alleged qualifications inadequate and their writing utterly unscientific.<sup>59</sup> Finally there were the administrative officials of the School to be appointed — the rector, vice-rector, and major-domo. The director nominated three for each office and the Tribunal chose one from each list.<sup>60</sup> All this was accomplished during the last few months of 1791 and on December 30th the Viceroy wrote to

<sup>58</sup> *Ibid.*, pp. 77-83, *passim*.

<sup>59</sup> *Ibid.*, pp. 85, 91.

<sup>60</sup> *Ibid.*, pp. 80, 84, 89.

Lerena in Spain reporting these developments and stating that the School was ready to open. He mentioned particularly the appointment of Bataller to the chair of physics, which he asked be confirmed, and the decision to request that the other two professors be sent from Spain, in spite of local protests.<sup>61</sup> In a royal order of October 28, 1792, the appointment of Bataller, the decision to seek the other two professors in Spain, and the

<sup>61</sup> A.G. Virreyes, Ser. II, 9/162, No. 669. When this letter was received by the Minister of the Indies in March 1792, the secretary set down the qualifications necessary for the professors of the two advanced courses — i.e., Chemistry as applied to Mineralogy and Metallurgy, and Geology and mining technique, and the duties of the offices. On June 1, 1792, instructions were sent to the Marqués de Llano, Spanish Ambassador to Germany, that if the two Royal pensioners, Don Andrés del Río and Don Francisco Codón, had completed their studies and were qualified, they should be offered the positions and return to Spain immediately. The Ambassador replied on June 30th that he considered del Río well qualified and sufficiently educated to fill the position, and had written to him in Saxony notifying him of his appointment and instructing him to return to Spain as soon as possible. Del Río spent the next year traveling to various mining centers of Europe, principally in Austria, Saxony, and Transylvania, but extending as far as the tin mines of Cornwall, and studying the latest mining and metallurgical technique; he arrived in Veracruz on November 14, 1794. (*A.G. Minería*, vol. 49, expediente 4, No. 5.) As to Codón, when the Ambassador wrote on June 30, 1792, he said that he had only completed one year of the course at Chemnitz, and, as he would not be needed at once, it would seem wise for him to put in another year studying before proceeding to Spain. This was approved, but, after the completion of this course, Codón sought more time to continue his studies, and during the next few years traveled and studied in Hungary, Transylvania, and at Freiburg with Professor Werner. As late as April 1795, we find him asking for four thousand reales to permit him to take certain advanced courses. Finally, in January 1797, the Ministry in Spain lost patience with him and wrote that if he did not return at once his pension would be stopped. Just what happened to him thereafter we do not know as there is no further reference to him. We know, however, that he never reached Mexico and that, as we shall see later, the German engineer, Lindner, was appointed to his post in the School.

The above information has been culled from two voluminous expedientes which recount in detail all the travels and correspondence of del Río and Codón — *A.I., Sec. 5, Aud. de Méx.*, Leg. 2245, expediente 4, and Leg. 2247, expediente 11. The subject is of interest both in showing the international character of learning at the time, and also the thorough preparation of the professional staff of the School. Also included in this expediente is the correspondence in regard to Don Fermín Reygadas' petition to be appointed to the Faculty and objections to Spaniards being appointed when Mexicans were available. The King emphatically approved Elhuyar's judgment that he was not qualified and the Viceroy's decision to dismiss the petition.

dismissal of the pretensions of the two Mexicans were all approved.<sup>62</sup>

With these matters disposed of there remained only the selection of the students for the first year. On September 22, 1791, notices were sent to all the provincial mining deputations informing them that the School of Mines would open on January 1, 1792, and instructing them to send in the names and qualifications of any boys in their districts who wished to apply for admission.<sup>63</sup>

<sup>62</sup> Gardoqui to Revillagigedo, October 28, 1792; *A.G. Cédulas*, vol. 153, No. 106.

<sup>63</sup> Ramirez, *Datos para la Historia*, p. 79; this notice was also published in the *Gaceta de México* (Tomo IV, No. 43, p. 400) on September 29th in the following terms:

"El día 1 de Enero próximo verificará el Real Tribunal General del Importante Cuerpo de Minería de este N. E. la erección del Colegio Métálgico que previenen sus Ordenanzas, en la calle y casa del Hospicio de esta Capital, y el día 7 del mismo se abrirá en el la clase primera de Matematicas, que será la sola que en el primer año se establezca de las quatro principales de que debe constar su enseñanza, y se irán disponiendo para los años subsecuentes.

"Qualquiera Persona de decente porte podrá acudir a dicha clase y demás que se establezcan, y para este se previene por ahora, que el Profesor D. Andres Joseph Rodriguez, a cuyo cargo estará la ensenanza de aquella, dará todos los días que no sean festivos y de guardar, dos horas de lección por la mañana, de las ocho y medio a las diez y media y por la tarde una hora de repaso o exercicio practico de las tres a las quatro.

"En este Colegio se admitirán desde luego dotados y mantenidos de comida y vestido por el fondo dotal de la Minería los veinte y cinco Jovenes que prescribe el art. 2 tit. 18 de sus Ordenanzas; lo que igualmente se previene, para que los Individuos que quisieren ser admitidos en el con esta calidad, hagan con tiempo su solicitud, a saber: los que residieren en los Reales de Minas ante su respectiva Diputación, para que informando sobre ella la pase al Real Tribunal General de Minería, como les tiene provenido a todos por Circular, y los que tuvieren su residencia fuera de los Minerales, ante el Director General del Cuerpo a quien corresponde la calificación de estas solicitudes, y proponer a dicho Tribunal los Sugetes en quienes haya de recaer la elección: bien entendido que los aspirantes a estas plazas, han de hacer constar con documentos las calidades que prescribe el referido art. 2, tit. 18, la de su edad, que a de recaer entre los doce y veinte años, y la de tener algunos principios de la Aritmética, como son las quatro reglas y los quebrados, mereciendo particular atencion los que hallandose sin Padres, o por no tener estos las facultades correspondientes, no puedan sin este auxilio aprovecharse de la instrucción que proporciona el Colegio. Se encarga a los que pretendan esta colocacion hagan sus cursos con la mayor posible brevedad, para que se tengan presentes en las Propuestas que se haran con la anticipación que corresponde a la época asignada para la



On November 7th the Director wrote the Tribunal regarding the qualifications of five applicants from Real del Monte, Tulancingo, Asientos de Ibarra, and Sultepec, observing that they did not adequately meet the conditions laid down. Consequently on November 16th the Tribunal wrote the respective deputies repeating the necessary qualifications that applicants must have.<sup>64</sup> On December 13th the director sent the Tribunal the names of the first eight students whom he deemed qualified for admission. He wrote that he had wanted to be able to send the complete list of twenty-five, but that the nominations had come in slowly and in many cases had to be returned to be corrected. He also said that many of the applicants had to be rejected, at least for the first year, as they lacked the necessary qualifications. Finally, a number of the applicants from Guanajuato were rejected so as not to have a disproportionate number of students from one real. The Tribunal approved the names proposed and notified the respective deputations thereof on the following day.<sup>65</sup>

Except for the completion of the enrollment, which was effected during the next few months, all was now ready for the long-awaited opening of the School. This took place, with appropriate formalities, on January 1, 1792. The following is a contemporary account of the opening exercises of the School.<sup>66</sup>

In the morning of the same (the first) day the opening of the Royal Metallurgical Seminary was celebrated in its principal hall, which, together with the outside of the building, was magnificently decorated. A general invitation had been issued to all the leading citizens to lend brilliance to the function by their presence. The latter was presided over by the *Real Tribunal del Importante Cuerpo de la Minería*, and it opened with the reading of Tit. 18 of the

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erección del Colegio, y tiempo que necesitara darse a los mas distantes de esta Capital de los que fueren electos, para que vengan para dicho tiempo."

<sup>64</sup> Ramirez, *op. cit.*, pp. 83-85.

<sup>65</sup> *Ibid.*, pp. 87-89.

<sup>66</sup> *Gaceta de México*, Tomo V, No. 1, p. 6, Jan. 10, 1792.

Royal Ordinances, and the Constitution and Plan drawn up by the Director of the said Tribunal, Don Fausto de Elhuyar. This was followed by a reading of the names and titles of the various officials of the said college, who at the same time received formal possession of their respective offices and took the corresponding oaths. At the conclusion of this ceremony the said Director made an address urging on all the faithful performance of their duties according to their respective obligations, and emphasizing the strong desire which he had that they should help him to play his part in furthering the progress of the new school. During the intermissions in the program various musical selections were rendered which added greatly to the solemnity of the occasion.

The staff of the said College is composed of its Rector, Dr. Don Francisco Julián Benedito; the Vice-Rector, Dr. D. José Rafael Gil de León; and the professors of Mathematics, Drawing and French, Captain O. Andrés Rodríguez, D. Bernardo Gil, and D. B. Mariano Chanin; who opened their respective classes on the seventh inst. at the assigned hours with only eight students, because some *Diputaciones* have not yet made their returns and others have not sent in complete information, but with this completed the number of twenty-five should be soon filled.

On the second a mass of thanksgiving was sung in the Church of the Hospice of the Nicolite Fathers, which serves as the Oratory for the College, which the Religious presented with the usual solemnity. After this was over the members of the college joined with the Tribunal and proceeded to pay their respects to the Viceroy, by whom they were received with his usual kindness and assured of his protection.

In the same way on the succeeding days of vacation, which ended on Epiphany, the students were presented to pay their respects to the principal persons who compose the Tribunal; and the public was reminded of the notice which appeared in the Gazette for the twenty-seventh of September, last, that on regular days those who wish may attend the classes to instruct themselves in the three subjects mentioned.

In such manner was this venture in American education formally launched. On the following day a register of students was opened wherein were recorded the name and full particulars of each student at the time of his entrance. On the 7th, the first classes in mathematics, French, and drawing began in spite

of the few students already enrolled. The mathematics class was greatly handicapped by the failure of the texts to arrive which had been ordered from Spain; and the Tribunal petitioned the Viceroy for permission to have a small edition printed locally for immediate use. For some reason this permission was refused in spite of repeated requests. On January 29th the director proposed that a class in Spanish grammar under Don Mariano Chanín be organized, and this was approved by the Tribunal on the following day.<sup>67</sup>

On January 31st Elhuyar wrote to Don Pedro Aparici, of the Ministry in Spain, a report of the progress to date.<sup>68</sup> He recounted the formal inauguration of the school, and the opening of the classes, because of his desire to get them started in spite of the enrollment not being full. The latter, he reported, was gradually being completed as the necessary information was received from the provincial deputies — with pains being taken to distribute the students fairly over the country. He commented on the inconvenience due to the lack of texts and the efforts being made to have textbooks printed locally.

During the next month the enrollment was gradually filled and the classes settled into their routine. At the end of February, Elhuyar reported to the Ministry that twenty-two students had arrived and that the mathematics class had begun in earnest after reviewing the "four rules" and common fractions and also that the class in Spanish grammar had begun. This he felt would be of great value as it had been found that the students had no knowledge of Latin or Spanish grammar to serve as a background for French.<sup>69</sup>

In mid-April Elhuyar described to the Viceroy a system of self-government which had been introduced into the school.<sup>70</sup> The students had been divided into groups and one of them

<sup>67</sup> Ramirez, *op. cit.*, pp. 93-100.

<sup>68</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2243, expediente 12.*

<sup>69</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2243, expediente 12.*

<sup>70</sup> *A.G. Minería*, vol. 49, expediente 2, No. 32.

appointed "chief" of each group. The latter had the duties of seeing that the members of his group devoted the proper hours to their studies, helping the backward ones or late arrivals in reviewing the work, seeing that the person and room of each of his group was clean and neat, and of being responsible for each group when it went outside the school, making sure that its members went where they were supposed to and kept inside the limits prescribed. It is most interesting that we should find this relatively modern idea of "student self-government" blossoming in an eighteenth-century Mexican institution.

The first term ended on June 25th with the holding of examinations on the work done thus far.<sup>71</sup> The examinations were held in the presence of the director, the rector, vice-rector, and the professors of the three courses, each student being questioned separately by all in turn. The examination in mathematics came first and covered all branches of arithmetic. This was followed by the principles of Spanish grammar, and drawing, wherein each student presented an example of his work. In commenting on the results as a whole, Elhuyar noted considerable differences among the students, due in part to the late arrival of some and the variation in age. He said that the tender age of some did not have such an effect on the grammar and drawing, where reflection and reason were not so important, but was very noticeable in the mathematics examination, where the younger students were behind the older ones. On the whole, however, he felt satisfied with the progress made and said that the backwardness of some would be made up in the succeeding term by devoting three of the afternoon class hours each week to arithmetic review, while the regular classes in mathematics proceeded to the study of geometry. Finally he reported that on the basis of these examinations prizes had been awarded to the best students, on July 9th.

Nothing further of particular importance occurred during the remainder of this year except the preparation for construc-

<sup>71</sup> Elhuyar to Viceroy, July 12, 1792. *Ibid.*, No. 17.

tion of the new school building which we will discuss below. On August 22d circulars were sent out to the provincial deputations describing the qualifications for students to be admitted to the School at the beginning of the second year.<sup>72</sup> At the end of August the mathematics texts ordered so long before finally arrived and the Tribunal collected them from Veracruz.<sup>73</sup> On December 11th Elhuyar wrote that all the courses had been satisfactorily completed and suggested that the Feast of the Virgin of Guadalupe, usually celebrated on December 20th, would be an appropriate occasion on which to hold the "Actos Publicos" and award the prizes for the first year.<sup>74</sup> The ceremonies consisted of a public examination, or demonstration, of the best students in each class before the Tribunal and other distinguished guests, and the subsequent awarding of prizes to those who made the best performance.<sup>75</sup>

Thus ended the first year of the School of Mines. In the meantime there had been some progress towards the building of a permanent home for the School. In November 1791, Elhuyar had solicited, through the Tribunal, permission to purchase a site belonging to the Academy of San Carlos.<sup>76</sup> The Viceroy granted his permission, subject to the royal approval, and instructed the Tribunal in the meantime to draw up preliminary plans.<sup>77</sup> This was done, and the Viceroy enclosed them with a dispatch of May 31, 1792, noting that on the 27th of the preceding November he had written for approval of his permission for the Tribunal to purchase the property and had as yet heard nothing.<sup>78</sup> At the end of December a royal order arrived, granting permission to the Academy of San Carlos to sell the site to the Tribunal.<sup>79</sup> On January 22, 1793, Elhuyar

<sup>72</sup> Ramirez, *op. cit.*, p. 107.

<sup>73</sup> *A.G. Minería*, vol. 49, expediente 2, Nos. 11 and 22.

<sup>74</sup> Ramirez, *op. cit.*, p. 109.

<sup>75</sup> *Ibid.*, p. 110; *Gaceta de México*, Tomo V, No. 25, p. 3, Dec. 25, 1792.

<sup>76</sup> Ramirez, *op. cit.*, p. 85.

<sup>77</sup> *Ibid.*, p. 86.

<sup>78</sup> Revillagigedo to Lerena, *A.G., Virreyes*, Ser. II, vol. 15/168, No. 403.

<sup>79</sup> Ramirez, *op. cit.*, p. 110.

was authorized to conclude the purchase in the name of the Tribunal and on March 14th the sale was negotiated with representatives of the Academy for \$30,000 and officially recorded on May 14th. During the succeeding summer the land was cleared of various huts; but it was 1797 before the distinguished architect, Don Manuel Tolsa, presented his plans for the school, and some years later before the building was ready for occupancy.<sup>80</sup>

After a short vacation over the Christmas season, the school was ready to begin its second year. A number of new students entered, two of whom, Manuel José Coteró and Andrés de Ibarra Salezán, later rose to positions of importance on the faculty of the school.<sup>81</sup> On January 7th the courses reopened, consisting of the mathematics, drawing, and grammar of the first year, and the new course in physics under Professor Francisco Bataller.<sup>82</sup> This course began with algebra and conic sections, which had been omitted from the first-year course in mathematics through lack of time, and went on to "practical geometry" (possibly surveying), dynamics, and hydrodynamics. Certain aspects of physics which it was hoped to include in subsequent courses were omitted this year both for lack of time and lack of the necessary laboratory equipment. The other classes went on in much the same way as before, except that the first-year students studied Spanish grammar while the second-year boys began on French.<sup>83</sup> The only other event worthy of mention in this year was the beginning of a library for the school. In August, Elhuyar suggested and the Tribunal approved three methods for building up a respectable collection. These were the purchase from the library of the fiscal, Juan Eugenio Santelices Pablo, of a selected list of books, the purchase from dealers or others in Mexico of the useful books

<sup>80</sup> *Ibid.*, pp. 112-116; 138.

<sup>81</sup> *Ibid.*, p. 111.

<sup>82</sup> *Gaceta de México*, Tomo V, No. 26, Jan. 8, 1793.

<sup>83</sup> Elhuyar to Revillagigedo, Oct. 24, 1793. *A. G. Minería*, vol. 49, expediente 3, No. 20.

available, and the authorization of the Tribunal's agent in Spain to purchase all books on mining in Spanish, Latin, Italian, or French which should in the future be published in Europe.<sup>84</sup>

The year 1794 in the School of Mines seems to have passed smoothly with few developments worthy of particular attention. The courses followed the same pattern as the preceding year — covering the various branches of mathematics and physics, although the latter was still handicapped by lack of equipment. During this year a start was made in forming a mineral collection by the purchase of part of a natural history museum from the estate of Santelices Pablo for the sum of \$1,514.<sup>85</sup> Probably the most important event of the year was the arrival at the end of October of Don Andrés del Río to fill the chair of mineralogy, as already described above. Although he landed in Veracruz on October 20th, del Río was occupied for some time with the shipment of the equipment which accompanied him and did not arrive in Mexico until December 18th.<sup>86</sup>

The opening of the 1795 school year was postponed until April 27th, apparently in part to give del Río an opportunity to prepare for his course. On April 23d Elhuyar wrote the Tribunal describing these preparations and outlining the work for the year. He said that del Río had arranged the mineral collection in proper order and drawn up a list giving the names and distinguishing characteristics of each specimen. He was also working on a textbook on "Orictognosia"<sup>87</sup> to serve as an accompaniment to this collection in teaching the class, and had completed the first part. Elhuyar also said that, inasmuch as the year was so far advanced and because of the lack of equipment, it was proposed to limit his course this year to the study

<sup>84</sup> Ramirez, *op. cit.*, p. 116.

<sup>85</sup> *Ibid.*, pp. 120-122.

<sup>86</sup> *Ibid.*, p. 124.

<sup>87</sup> This term seems to have been applied to a combination of paleontology and mineralogy — particularly the identification of minerals and rocks by means of fossils.

of minerals, putting off practical mining until later. In order to give del Río time to complete his book and Bataller an opportunity to work on a text for his class, it was planned that the physics and mineralogy classes should meet alternately three days a week. These suggestions were approved by the Tribunal and the classes opened on April 27th, that in mineralogy having ten students.<sup>88</sup>

The classes for 1796 followed the pattern already laid down and were completed satisfactorily by the middle of November. This year del Río's course was extended to include, besides orictognosy, geology and elements of mining engineering. There also was begun late in the year the fourth course, in chemistry and metallurgy, under the German engineer Don Luis Lindner, who, at Elhuyar's suggestion, was appointed acting professor until Don Francisco Codón should arrive from Spain.<sup>89</sup>

Early in this year the personnel of the School took cognizance of the fact that, under a strict interpretation of the Ordinances, Elhuyar's term as director would expire the following year. With this in mind a petition was addressed to the Tribunal signed by all the staff of the college and representatives of the students urging that he be reappointed for at least another nine-year term. This petition set forth Elhuyar's great services, particularly in inaugurating the school, his broad scientific training, executive ability, and pleasing personality. It expressed the view that no one else could be found who could carry on the job as well as Elhuyar; there was no Mexican with the requisite training or knowledge, and no European would have Elhuyar's familiarity with local conditions and problems.<sup>90</sup> When one remembers that Elhuyar was a Spaniard and a royal appointee this was a truly remarkable tribute from a group who were predominantly Mexicans. It speaks not only for his ability but for his tactfulness and success in arousing

<sup>88</sup> Ramirez, pp. 126-127.

<sup>89</sup> Ramirez, p. 135.

<sup>90</sup> Ramirez, pp. 130-133.



loyalty rather than jealousy among his associates. Elhuyar himself was on leave of absence during most of the year. On February 24th he left for Oaxaca and spent the succeeding months reconnoitering and examining the mining districts of the Río de San Antonio, Sierra de Ixtlán, and San Miguel de las Peñas in this region, on which he sent a number of reports to the Tribunal. This field work, added to his earlier trips to Guanajuato and Zacatecas, was undoubtedly of much value in adapting the courses in the school to actual conditions in the various districts of Mexico.<sup>91</sup>

On the occasion of the public exercises for the year (November 14-16, 1796), Professor Andrés del Río presented a most interesting discourse explaining and justifying the value of scientific training for practical mining.<sup>92</sup> He began by answering those persons who criticized the scientific teaching and experimentation carried on in the School of Mines, saying that in general they were not mining people (who had recognized the value of the school and supported it) but ignorant outsiders. As the main criticisms had been directed against his course in "Orictognosia," "Geognosia," and "Arte de Minas," he devoted the principal part of his discourse to a discussion of the subjects studied under these titles and their application to practical mining. He described "Orictognosia" as the study and classification of fossils and minerals — a combination of paleontology and mineralogy. He traced the development of this science from early times and emphasized the necessity for continual experimentation to determine new methods of identification and discover new properties of and new uses for various minerals. His term "Geognosia" corresponded to the science of geology — particularly the branches of structural and mining geology; he pointed out the practical value of this by showing that one could expect the same results from similar occurrences of mineral-bearing strata in the same type and

<sup>91</sup> *Ibid.*, pp. 134-135.

<sup>92</sup> *Gaceta de México*, Tomo VIII, No. 30, Jan. 18, 1797.

formations of country-rock in different regions, as for instance in Europe and America. He showed in detail how a knowledge of the various geologic formations would help miners in the location of ore bodies and their economic exploitation. Under "Arte de Minas" he described the application of theoretical science to such practical problems as mine drainage, ventilation, ore extraction, and milling.

This discourse cannot fail to persuade us, as it was meant to persuade the skeptics of the time, that the School of Mines was a practical institution and presented applied science on a surprisingly modern basis.

The year 1797 opened with a triennial session of the *Junta General de Minería*, which endorsed unanimously the petition that Elhuyar be continued in his post as director.<sup>93</sup> During this year Luis Lindner was ill, and in addition to his other duties Elhuyar himself taught the course in chemistry and metallurgy, with the assistance of Francisco Fischer, one of the other German engineers.<sup>94</sup> The public examinations for 1797 were held on October 23-27, and the following article from the *Gaceta de México* gives such a complete description of this annual function and also of the ground covered in the various courses that it is worth quoting:

On the 23rd, 24th, 25th, and 27th of the past month there were celebrated in the presence of the *Real Tribunal General del Importante Cuerpo de la Minería de esta Nueva España*, in the College of St. Peter and St. Paul, the public acts which the students of its Royal Seminary are accustomed to hold annually; (these acts were) directed by Capt. D. Andrés Joseph Rodríguez, Professor of Mathematics, Don Francisco Antonio Bataller, Professor of Physics, Don Andrés del Río, Professor of Mineralogy, and Don Fausto de Elhuyar, Director General of the said Tribunal and acting Professor of Chemistry; and the intervals were filled with various sonatas rendered by a complete orchestra.

On the first day Don Joseph Mariano Ximénez, Don Miguel

<sup>93</sup> Ramirez, p. 136.

<sup>94</sup> *Ibid.*, p. 137.

Alvarez Ruiz and Don Joseph María Villasante were examined on plane Trigonometry, Conic Sections, and Infinitesimal, Differential and Integral Calculus, as far as these subjects are covered in the textbook of Don Juan Justo García.

On the second day there appeared on experimental Physics Don Silvestre Osares, Don Felipe Obregón, and Don Joseph María Vela, the first being examined on the properties of static, dynamic, hydrostatic, hydraulic and aerometric bodies, according to their professors' text, and the two latter, having passed these subjects the year before, on this occasion displayed their knowledge of optics and the general properties of heat, electricity, magnetism, meteorology, astronomy, and the planetary system; on this day the hall was furnished with all the physics apparatus which the college possesses.

On the third day, when there were assembled other apparatus having to do with mining, and various boxes of rocks and fossils, Don Vicente Valencia, Don Francisco Alvarez, and Don Vicente Moral presented themselves on *Orictognosia*, *Geognosia* and the *Laboreo de Minas*. On the first they gave a detailed description of the different characteristics found in fossils, and of their classification or distribution into classes, families, genera, species, and variations, applying these principles to the earthy, saline, combustible, and metallic substances which comprise the mineral kingdom; they described the external characters of these latter in the samples which were given them, indicating at the same time their structure, ore-bearing properties, and the uses which could be made of them.

On the subject of *Geognosia* they explained the differentiation of mountains into primary and secondary, sedimentary and volcanic, explaining the peculiar circumstances of their formation, the difference in the materials of which they are composed, and the different structure observed in the various formations, with other proofs of their differing origin and age. Likewise they dealt with the diversity in the ore-bearing rocks and the minerals themselves in the different formations, expounding the theory of the origin of veins, based on the phenomena which the latter present.

Including in the *Laborio de Minas* everything which occurs from the first discovery of the veins and other ore bodies to the final extraction of the ore, they described the means which are employed in the location of the ore and determination of its qualities, those followed in the actual mining of the ore according to the texture and formation of the rock, the distribution and plan of the subterranean workings so as to provide the greatest convenience and

economy of operations, the methods by which the latter are strengthened and prevented from caving in, and finally the measures taken, according to the local circumstances, to provide for the removal of the ore and waste from the mine.

On the last day, Don Casimiro Chovell, Don Manuel Cueto, Don Joseph María Montilla, and Don Mariano Pavía were examined on Chemistry; they described its general principles, as well as the different substances which at the present time are called simple and those which by virtue of being in union with one or more others are called compound, dealing with the properties peculiar to each, although in the case of compounds they limited themselves to those belonging to the mineral kingdom.

These subjects were treated according to the new theory of M. Lavoisier, adopted by the principal chemists of the day, and founded on the most rigorous and careful analytical and synthetic proofs: — for which purpose there were brought to the hall the appropriate apparatus for burning charcoal, phosphorous, alcohol, the decomposition of water, and others necessary for the occasion.

These acts were terminated, according to custom, with an inspection by chosen experts of the drawings of figures, landscapes, plans for plants and buildings, and machinery executed by the students under the direction of the masters Don Bernardo Gil and Don Estebán González; and finally the prizes for all the classes were distributed, all (the students) having passed their respective examinations to the satisfaction of the numerous and learned company.<sup>95</sup>

During the following year (1798) the first group of students completed their course of instruction in the School and departed for various mining centers to begin their practical training, or internship. Ten of the thirteen students eligible had passed a general examination satisfactorily and on May 2d Elhuyar proposed that four of them be sent to Guanajuato and three each to Zacatecas and the Real de los Catorce. On May 26th a circular letter was sent to the deputations of these three places instructing them as to the work and conduct of these students and the supervision they were to exercise over them. The students left for their respective destinations on June 1st

<sup>95</sup> *Gaceta de México*, Tomo VIII, No. 46, pp. 374ff., Nov. 29, 1797.

and had arrived well before the end of June. In the middle of August the Tribunal voted to provide them with books, mining tools, and assaying equipment at the expense of the College.<sup>96</sup>

Reports on the work and progress of these students seem to have been rather rare, but a year later there was some information from the deputies of Zacatecas and Guanajuato. The former sent a dissertation on the Mineral de San José del Yermo written by Vicente Valencia and the plan of the Mina de Tecolotes drawn by José Rodríguez. On August 17, 1797, the Tribunal instructed the Deputation of Guanajuato that Casimir Chovell should write a dissertation on "la Negociación de Minas de Azogue de la Sierra de Durazno; sus hornos, beneficio, y demás anexas"; that José de Zárate and José M. Montilla should make a study of the Valenciana mine; and that Vicente Herrera should write on refining and smelting as practiced and as carried out by the German engineer, Federico Sonneschmidt. The Tribunal also instructed the deputation to advise it whether they thought the students should continue there or go to some other district and whether the ones working at mining should switch with the ones engaged in refining.<sup>97</sup> We will learn more of this work shortly, when this first group was ready to terminate its two-year internship.

Now that the time was approaching when the first contingent of trained engineers would be ready to go out into the world, a royal order of April 19, 1798 was particularly appropriate.<sup>98</sup> After expressing his confidence that the zeal and abilities of the director and staff of the College would produce able and well-trained graduates, the King authorized the examination of the most promising and their appointment as mining directors and engineers for the Viceroyalties of Peru and Buenos Aires, and the Presidencies of Guatemala, Quito, and Chile.

<sup>96</sup> Ramirez, pp. 142-145.

<sup>97</sup> *Ibid.*, p. 152.

<sup>98</sup> *A.G. Cédulas*, vol. 169, No. 126.

They would be paid by the crown and their duties would be generally to introduce the most efficient and economical methods of mining and refining in these regions. Thus the School of Mines of Mexico was raised to an important position as the potential nursery for mining engineers for virtually the whole of Spanish America, and new horizons of opportunity opened before its alumni.

In this same dispatch the King extended the term of Elhuyar so that he should continue to serve during the royal pleasure and promised that his family should be provided for in case of his death.

The only other event of particular interest during this year was the acquisition by the Tribunal of a mineral collection formed by Sonneschmidt for the sum of \$500. On November 19th, Elhuyar informed the Tribunal that seven of the seventeen endowed scholars would be ready to proceed to their field work by the end of the ensuing January, and recommended that six new students be admitted.

In 1798 Elhuyar made another trip to Oaxaca and was away from Mexico for about six months. During this period the deputy-general, D. Manuel Valcarce y Guzmán, served as acting director.<sup>99</sup> Beginning in 1798, a course in Latin was offered in the School, taught by one of the endowed students, Dr. D. José Mariano Fernández de Castro, who received a salary of \$300 for his labors.<sup>100</sup> In March the students who had completed the four-year course were given a general examination before Elhuyar, Lindner, Bataller, and del Río. Five of them passed satisfactorily and on April 8th left for Zacatecas and Guanajuato.<sup>101</sup> On April 17th the Tribunal sent a petition to the crown that D. Luis Lindner be named regular instead of temporary professor of chemistry, in place of Don Francisco Codón, who it will be remembered had been

<sup>99</sup> Ramirez, p. 151.

<sup>100</sup> *Ibid.*, p. 149.

<sup>101</sup> *Ibid.*, p. 150.

appointed in 1791 but had never arrived.<sup>102</sup> Don Francisco Antonio Bataller, professor of physics, died on April 25, 1800, and on May 5th, the director suggested that until a permanent professor could be chosen, Don Salvador Sein, an official of the Viceroy's secretariat, who had served as one of the examiners in the public examinations, be appointed as acting professor. This was approved by the Tribunal on June 11th.<sup>103</sup>

On May 12, 1800, Elhuyar sent to the Tribunal a set of instructions which he had drawn up for the students who were completing their practical work and were to present dissertations on what they were doing.<sup>104</sup> Four subjects were chosen for these theses, which were divided among the candidates as we shall see below. The four topics were as follows: (1) "A Geological Description of the Real de Minas of ———, with a map of the location and surrounding hills"; (2) "A description and plan of a mine"; (3) "A description of the refining by the quicksilver method of gold and silver as practiced in the Real de ———"; (4) "A description of refining by smelting as practiced in the Real de ———." The detailed instructions as to what each thesis should contain provided for such complete and integrated reports that not only would they give clear evidence of the progress of the students but taken together would afford a valuable geological and engineering survey of the most important mining districts of the country. Once again one is impressed by the modern point of view and the sound scientific technique evidenced. On May 14th the Tribunal sent these instructions to the three deputations of Guanajuato, Zacatecas, and Catorce, assigning one of the topics to each of the four students in the first and one of the first three subjects to each of the three students in the two latter districts.<sup>105</sup> On July 2d the director called the attention

<sup>102</sup> Ramirez, p. 151.

<sup>103</sup> *Ibid.*, pp. 158, 173.

<sup>104</sup> *Ibid.*, pp. 158-171.

<sup>105</sup> *Ibid.*, p. 172.

of the Tribunal to the fact that the two-year "internship" of the first group of students sent to Guanajuato, Zacatecas, and Catorce had been completed and that arrangements should be made for their return to Mexico to take their professional examinations. The Tribunal wrote promptly to the three deputations and by the end of the year all the students had filtered in and presented their dissertations to the director; these were read both by him and the other members of the Tribunal. Finally at the end of January 1801 each candidate was examined by a jury consisting of the director and the four professors of the College; all appear to have passed satisfactorily and received their degrees as "Peritos de Minas."<sup>106</sup> In the meantime the public exercises of the College for the year 1800 were held during the first week in November. On this occasion Andrés del Río read a most interesting discourse on ore-bearing veins, their origin and occurrence, and the history of their study.<sup>107</sup> On November 15th the Tribunal announced that the examination of candidates for the permanent post of physics would be held in November of the following year.<sup>108</sup>

In February 1801 the director developed an interesting plan of having a number of *Ayudantes de Clases*, or assistants, to help both the professors and the students in the work of the classes. There was also apparently the thought that it would offer good experience to young graduates who had completed their education, and would serve as a training ground for future professors. On February 12th the director proposed the names of Manuel Ruiz de Tejada, Francisco Alvarez, and Manuel Cotero, all of whom had just passed their professional examinations and received their degrees, asking the Tribunal to

<sup>106</sup> Ramirez, pp. 173-175; *Minería: Ordenes y Oficios*, F. 9, Jan. 22, 1801. (See bibliography for description of this manuscript.)

<sup>107</sup> *Ibid.*, p. 175; *Gaceta de México*, Tomo X, No. 27, Nov. 18, 1800, and supplement.

<sup>108</sup> Ramirez, p. 175.



appoint two of these as *ayudantes*. At the same time Elhuyar sent in an outline of the obligations and duties of these positions which the Tribunal approved the following year.<sup>109</sup>

Under this plan the *ayudantes* were to act as assistants to the professors, preparing the laboratory equipment and experiments for each lecture, and giving such other aid as might be required. They were also to meet the respective classes of which they were assistants each afternoon, to review the day's lesson and clear up any questions on the part of the students. If any backward students needed special instruction, the assistants to give it under the direction of the professor and Elhuyar. The rest of their time on ordinary days was to be devoted to advanced study on their own account either in the library or laboratories, under the general guidance of the faculty. In cases of absence or illness of any of the professors, the assistant was to take over his class under the supervision of the director. On Sundays and holidays and in the hours of recreation they were to be fairly free to pursue their own activities, but were subject to almost the same strict curfew rules as the students themselves. Besides aiding the latter in their studies, the assistants were to supervise their conduct and deportment. They were to be furnished board and lodging in the College, paid three hundred pesos a year, and to have the privilege of using the School laboratories for private assays for miners, providing that they supplied their own materials and had their fees approved by the director. Besides being of mutual benefit to the School and the individual, the plan offered an opening for the graduates beyond the opportunities that might arise in the field of active mining. Manuel Ruiz de Tejada and Manuel Cotero were the first graduates appointed to these new positions by the Tribunal.<sup>110</sup>

There was little further of any particular interest during the year 1801, except the arrival in December of two boys

<sup>109</sup> *Minería: Ordenes y Oficios*, ff. 39-41. Feb. 16, 1802.

<sup>110</sup> Ramirez, *op. cit.*, pp. 179-180.

from the Philippines to enter the School in accordance with royal orders of April 10, 1784, and November 15, 1788,<sup>111</sup> and the appointment of Don Salvador Sein as permanent professor of physics after the duly warned examinations.<sup>112</sup> Another problem which cropped up at the end of this year and the beginning of the next which has some interesting side lights concerned the teaching of Latin. A class in Latin had been instituted provisionally in 1799, and in his report to the Tribunal on December 2, 1801, on the progress of the various classes, Elhuyar raised the question of the establishment of permanent chairs of logic and Latin. The fiscal of the Tribunal asked for reports from Elhuyar and the Latin professor on the progress of the class and as to how much the students really had learned.<sup>113</sup> This report is missing, but on February 15, 1801 the assessor gave an opinion which was concurred in by the Tribunal, that the whole subject of the establishment of chairs of Latin and logic should be studied carefully by a junta of all the officials of the College; particularly the question as to how these courses would fit in to the general curriculum. The interesting part of the assessor's report is the very definite opinion he expressed that it would be the greatest possible mistake for Latin, French, logic, or any of the other courses to be taught at the same time. His idea was that during any one term the students should devote their entire attention to one subject, and that any attempt to have classes in chemistry and Latin, for example, on alternate days, or worse still in alternate hours of the same day, would only result in hopeless confusion in the minds of the students and failure to learn anything. It was for this reason that he advocated the most careful study of the place of these new courses in the curriculum before anything definite was decided. The Tribunal

<sup>111</sup> Ramirez, *op. cit.*, p. 181; *A.G. Reales Cédulas*, vol. 127, No. 165, vol. 141, No. 145; apparently a number of boys had arrived from the Philippines in 1786, only to find that the School had not as yet opened.

<sup>112</sup> Ramirez, *op. cit.*, p. 182; *Minería: Ordenes y Oficios*, f. 32, Dec. 11, 1801.

<sup>113</sup> *Minería: Ordenes y Oficios*, f. 30, Dec. 2, 1801.

approved this recommendation of further study and so instructed Elhuyar.<sup>114</sup>

About this time the School was able to add to its growing mineral collection through the authorization by the Tribunal of the purchase for two hundred pesos of a collection of minerals and fossils made by the architect D. Luis Martín.<sup>115</sup> The failure of the collection ordered from Europe to arrive may have been a blessing in disguise, as it compelled the School to accumulate a native one.

On July 12th the director proposed that the students engaged in practical work should be sent to near-by centers such as Tasco and Real del Monte rather than Guanajuato and Zacatecas so that the Tribunal and the staff of the College might keep in closer touch with them.<sup>116</sup> The Tribunal approved this on the 27th and ordered that the next group of students returning should bring their books and instruments with them.<sup>117</sup> At the same time the director made another interesting proposal. He wrote that the assistant, D. Manuel Ruiz de Tejada, had suggested that the study of mathematics would be made more valuable if calculus were added to the second course in this branch. Elhuyar agreed with this and proposed that Tejada be named acting professor for the first course leaving Rodríguez free to devote his entire attention to the second. He said that this might be thought to interfere with one of the objects of the appointment of assistants — namely the opportunity for them to increase their own knowledge — but pointed out that Tejada had already served as assistant in the courses of physics and mineralogy, and that he would be able to continue his own studies; furthermore he said that this appointment and the hope of eventually gaining one of the permanent professorships would serve to tie him

<sup>114</sup> *Minería: Ordenes y Oficios*, ff. 37-38, Feb. 15, 1802.

<sup>115</sup> *Ibid.*, f. 42, Mar. 29, 1802.

<sup>116</sup> Ramírez, *op. cit.*, p. 184.

<sup>117</sup> *Minería: Ordenes y Oficios*, f. 44.

more closely to the School.<sup>118</sup> This characteristic of Elhuyar in recognizing and rewarding merit on the part of individual students must have been one of the factors which contributed to his great popularity with the student body. The Tribunal referred this proposal to the fiscal and assessor, postponing action on it until after the resolution of the questions about Latin and logic. However, as we shall see, the matter resolved itself through the death of Rodríguez a year later.

During the year 1803, in addition to the regular cycle of the college year there were two events of interest. It appears that the assistants had complained that the obligations and duties imposed on them in the plan of 1802 were too strict, not in keeping with the dignity of their offices, and unfair in comparison with the obligations of similar positions in the university and other colleges. In a long opinion the fiscal dismissed their objections and showed in detail that in reality their prerogatives, salary, and duties compared very favorably with those of other comparable positions. He did recommend a concession to permit them to stay out until nine or ten o'clock at night on feast days or holidays! The Tribunal confirmed the views of the fiscal on May 17th, and ordered the director to see that the assistants obeyed them. The latter accepted the decision philosophically and on June 6, 1803 wrote the director to this effect. In view of this attitude the Tribunal relented somewhat and on June 8th resolved to allow the *ayudantes*, in cases of real necessity, to go out at other times than those fixed in the regulations and to sleep outside the School — the director to be the judge of the necessity.<sup>119</sup>

Another development of importance during the year was a reorganization of the course in mathematics. It will be remembered that this had already been divided into two classes, both taught by Professor Rodríguez, the first covering arithmetic, elementary geometry, and plane trigonometry, and the second

<sup>118</sup> Ramirez, *op. cit.*, pp. 184-185.

<sup>119</sup> *Minería: Ordenes y Oficios*, ff. 63-67.

algebra, conic sections, and applied geometry. On June 6th the director wrote the Tribunal that Rodríguez was ill and that the assistants Tejada and Cotero had taken over the two classes; subsequently Cotero had become ill and the director had appointed another former student, D. Andrés Ibarra, to substitute for him. On July 2d Rodríguez died and on the 8th Elhuyar proposed that the courses in mathematics continue in the hands of Tejada and Ibarra for the remainder of this year, each receiving part of Rodríguez's salary, and that the formal call be issued for candidates for the permanent posts. The director proposed at the same time that this division of the chair of mathematics be made permanent. The Tribunal approved the temporary arrangement and reserved its decision as to the future.<sup>120</sup> When the time came for the public examinations in October, Elhuyar wrote that Tejada and Ibarra had carried out their duties so well that their classes had made up all the ground lost through the illness and death of Rodríguez and he felt sure that they would give a good account of themselves.<sup>121</sup> The public exercises were held on October 17th to 21st, and the two classes in mathematics gave such a good performance that on the 25th the Tribunal voted the payment of \$1000 to be divided between Tejada and Ibarra in recognition of their efforts.<sup>122</sup> These examinations were of particular interest this year because of the presence of the distinguished scientist Baron von Humboldt. He took an active part in examining the students in all the courses, aided them in manipulating the machines, and expressed himself as very favorably impressed with their mastery of the subjects of instruction. At the conclusion of the examinations the distinguished Dr. Beristain, Canon of the Cathedral, made an address to the students extolling Humboldt as an example for them to hold

<sup>120</sup> Ramirez, *op. cit.*, pp. 188-190; *Minerla: Ordenes y Oficios*, f. 66, June 7, 1803.

<sup>121</sup> Ramirez, *op. cit.*, p. 190.

<sup>122</sup> *Minerla: Ordenes y Oficios*, f. 78.

before them and worthy of their emulation.<sup>123</sup> One result of this visit of Humboldt was the purchase by the College of his collection of instruments at a very reasonable figure. This was authorized by the Tribunal on December 5th, and early in the following year it accepted with thanks a further offer of the Baron to purchase in Europe other instruments and equipment needed by the College.<sup>124</sup>

In the meantime (November 12, 1803) the Viceroy had approved the permanent division of the class in mathematics, with two professors at a salary of \$2000 each.<sup>125</sup> At Elhuyar's suggestion, the Tribunal authorized Tejada and Ibarra to continue as acting professors for the rest of the year, each receiving a bonus at the end of the year representing one-half the difference between the salary of an assistant and that of the regular professors.<sup>126</sup> When the time fixed for the examinations for the permanent professorships came on September 3d, only two candidates presented themselves, namely Tejada and a cleric named Juan José de Oteiza. They were duly examined on September 15th and 17th, and on the 20th Elhuyar recommended that Tejada be appointed for the advanced class, as he had training in mining, and that Oteiza take over the elementary class. The Tribunal approved this on October 3, 1804, and thus Tejada became the first graduate of the School to become a regular professor therein.<sup>127</sup>

During the year 1803 there were two important developments regarding the admission and withdrawal of students. Prior to that time the Tribunal had had to expel a number of students, and in several cases students had withdrawn from the School for various family reasons. The matter had come to a head in 1802, when an endowed scholar named Felipe Obregón had run away to join the army, and the matter of

<sup>123</sup> *Gaceto de México*, Tomo XI, No. 47, Nov. 11, 1803.

<sup>124</sup> *Minería: Ordenes y Oficios*, f. 80; Ramirez, *op. cit.*, p. 191.

<sup>125</sup> *Ibid.*, p. 191.

<sup>126</sup> *Minería: Ordenes y Oficios*, ff. 88, ff. 116; Ramirez, *op. cit.*, p. 192.

<sup>127</sup> *Minería: Ordenes y Oficios*, ff. 109-111; Ramirez, *op. cit.*, p. 194.

policy had been referred to the King. A royal order was issued on March 25, 1803 which laid down the conditions of withdrawal for students. It ordered that endowed students should only be allowed to withdraw for serious causes, such as illness or family changes, after an investigation by the Tribunal, and that in these cases the family should be required to pay to the School the amount expended by the latter on the student, computed as if he had been a paying scholar. Paying scholars should be free to withdraw at any time, but as a matter of courtesy should give due notice to the director, professors, and Tribunal. The mining deputations were to notify candidates for endowed scholarships of these conditions at the time of their application, and admission to the School was to imply acceptance of the obligations. The subject had already been to the fore during this year, as on January 18th the Tribunal had voted to allow the withdrawal of three students, and on June 28th ordered the director to proceed to the expulsion of José María Salinas for insubordination and stirring up of discord among his fellows.<sup>128</sup> His father was notified to come and get him but delayed so long that the lad escaped and disappeared.<sup>129</sup>

The terms of admission of new students were complementary to the withdrawal of old ones, and these too were revised during the course of 1803. On August 26th Elhuyar presented the following "Instruction" to the Tribunal, which approved it on August 31st and ordered it printed and distributed to all the provincial mining deputations.

Instructions on the manner of verifying the  
qualifications of candidates for admission  
to the Royal Mining Seminary.<sup>130</sup>

(1) In order to verify the age of the candidate, he shall present a certificate of Baptism, sworn to by the Registrar, or in his lack,

<sup>128</sup> *A.G. Cédulas*, vol. 187, No. 99. *Minería: Ordenes y Oficios*, f. 70.

<sup>129</sup> *Ibid.*, ff. 54-57, 69, 73.

<sup>130</sup> *Ibid.*, ff. 74a and 74b.

by the *Diputación de Minería* or *Juez Real* of the territory if it be outside the Province of Mexico.

(2) It shall be sworn by the formal oath of at least three witnesses that the candidate is of Spanish blood, or noble Indian, or Mestizo of the first class, and that he is of legitimate birth, with the names of his parents also being given.

(3) In this or another similar declaration evidence shall be given of his character and good habits.

(4) In the same declaration, or another similar one, it shall be stated whether he is the descendant or close relation of miners, with information as to what Real his family inhabited and of any merit they may have achieved in the mining industry, whether his parents are at the time living in a *real de minas*, and if they are poor. This information is essential in the case of all candidates for admission as endowed scholars.

(5) To these documents there should be added the certificate of a physician, endorsed in the same manner as the baptismal one, as to the sanity and good constitution of the individual.

(6) Likewise the candidate shall present himself before the respective *Diputación Territorial de Minería*, or the Royal Tribunal General, to be examined on reading, writing, and his knowledge of the four rules of Arithmetic and common fractions; the deputies shall give a certificate as to the results of this examination.

(7) These documents shall be presented to the respective *Diputación de Minería*; which shall make sure that they contain all the information mentioned above, and if not, see that it is completed. The deputies will then set forth these different points, and forward the whole file to the Royal Tribunal General, at the expense of the candidate.

The Deputies shall make known the terms of this Instruction to all the miners of their district, in order that those who may have an interest in any possible candidates may be informed of its terms and take the necessary measures to fulfill them, with the knowledge that if any of the required information or documents are lacking their pretensions will be dismissed.

In connection with the admission of new students, the Tribunal also decided during this year to raise the fee for paying students from one hundred and fifty to two hundred pesos per year. This was done to help reduce the expenses of the School as much as possible. The Tribunal wrote that



it was convinced that the paying students could not be maintained decently and properly on one hundred and fifty pesos per year and hence was authorizing the increase to take effect at the beginning of the year.<sup>131</sup>

At the end of 1804 Don Salvador Sein, professor of physics, contracted a brain ailment and had to go on sick leave. To fill his place Elhuyar suggested that the new professor of the first course in mathematics, D. Juan José de Oteiza, be named acting professor of physics and D. Francisco Alvarez, a former student and assistant, take over the first course in mathematics.<sup>132</sup>

In 1799 a course in Latin had been opened as a temporary experiment, accompanied by considerable discussion over the place of this and a course of logic in the curriculum. This course in Latin had continued on a temporary basis under a succession of different masters, but on January 11, 1805 the Tribunal decided to establish it on a permanent and formal basis.<sup>133</sup> It was to continue for the present with the acting master, Don Ignacio Guzmán, and with the same hours as heretofore, until the Tribunal could fit it in as part of the regular curriculum. There was still considerable disagreement as to whether the School of Mines should take on the additional courses or not. Most of its staff, the assessor of the Tribunal, and several of the deputies-general felt that it should, in order to prepare the boys properly to take their places in society as well as in their profession. Others, including the fiscal of the Tribunal and the administrator-general, opposed it, feeling that these subjects were not necessary for a practical mining engineer and would simply take time from more important matters. After the Tribunal's decision mentioned above, the question went to the Civil Government where again there was a division of opinion. The fiscal opposed the extension of the

<sup>131</sup> *Minería: Ordenes y Oficios*, f. 79.

<sup>132</sup> Ramirez, *op. cit.*, p. 197.

<sup>133</sup> *Minería: Ordenes y Oficios*, f. 128.

School's activities, while the assessor and the Viceroy Iturrigaray supported it; and on September 26, 1806 the latter wrote to Spain describing all these differing opinions and asking for the King's decision.<sup>134</sup> The King finally disposed of the whole question in a royal order of February 20, 1807, in which he disapproved of the whole project, including in his disapproval all the suggested courses and some which had already been established — that is, Spanish grammar, Latin, logic, geography, and history.<sup>135</sup> While this would seem to have closed the matter, apparently it did not bother the Tribunal, since, as late as January 5, 1810, we find it approving the separation of the classes of Latin and logic and the suppression of French.<sup>136</sup>

Early in 1806 D. Luis Lindner, professor of chemistry and mineralogy, died and Elhuyar, feeling that there was no one qualified for the position in Mexico, proposed that someone be sought from Spain.<sup>137</sup> At the same time he proposed an increase in salaries for the faculty which would have put them on the following scale: First course in mathematics, \$1500; second course in mathematics, \$2000; physics, \$2500; chemistry and mineralogy, \$3000 each. There were a number of other temporary vacancies due to illness or absence among the faculty during this year and these were all filled with former students acting either as assistants or temporary professors.<sup>138</sup> As these boys and others finished their work and received their degrees, the ranks of the endowed students were kept fairly full by the appointment of new scholars, as evidenced by the naming of five boys on January 4, 1806, and three others on January 14, 1807.<sup>139</sup>

In 1807 and again in 1808 Elhuyar spent some time in Real

<sup>134</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2248, expediente B3.

<sup>135</sup> *A.G. Cédulas*, vol. 198, No. 81.

<sup>136</sup> Ramírez, *op. cit.*, p. 214.

<sup>137</sup> *Ibid.*, p. 200.

<sup>138</sup> *Ibid.*, pp. 201-204.

<sup>139</sup> *Minería: Ordenes y Oficios*, ff. 140 and 151.

del Monte working out various new methods of mine drainage. During his absence the deputy Manuel José de Anza served as acting director.<sup>140</sup> In the public examinations of 1807 all the courses were for the first time in charge of graduates of the School, either acting as regular professors or as substitutes for professors, who, like del Río, were temporarily absent. Apparently they discharged their duties competently and the same situation was repeated the following year.<sup>141</sup>

This brings us down to the year 1810 and the beginning of the revolutionary period, which continued with varying degrees of intensity for the next decade. As we shall see in another chapter, this movement had a well-nigh disastrous effect on the mining industry as a whole, but of more immediate interest is the question as to what impact it had on the School of Mines. The interesting thing is it seems to have affected the regular routine very little. During the whole period the regular courses seem to have continued as usual and students were admitted and graduated as before. Another question of interest is the attitude of the personnel of the School — both student and faculty — as well as the Tribunal, toward the insurgent movements. This is rather hard to answer categorically, especially as the material is scanty, but perhaps we can draw some guidance from the few instances which give indications.

The data for the year 1810 and the events resulting from Hidalgo's uprising are rather contradictory. On November 2d the Viceroy Venegas notified the Tribunal that he had appointed the former student and professor Don Manuel Ruiz de Tejada to the Corps of Engineers of the government forces.<sup>142</sup> At the same time, however, other former students were taking an active part with the insurgents. It will be remembered that Guana-juato was the scene of the first movements of independence,

<sup>140</sup> Ramirez, *op. cit.*, pp. 204-206.

<sup>141</sup> *Ibid.*, pp. 205 and 208.

<sup>142</sup> Ramirez, *op. cit.*, p. 217.

falling to Hidalgo's armed rabble scarcely two weeks after the "Grito de Dolores." Similarly, after the government forces were organized, it was one of the first objects of their counter-attack. This was successful, and on November 25th Calleja, the government leader, entered Guanajuato.<sup>143</sup> Among those seized in reprisal for the massacre of the Spaniards imprisoned in the Alhondiga were three former students of the School of Mines — D. Casimir Chovell, D. Ramón Fabie, and D. Rafael Daviles. The first had been a brilliant student while in the School and at the time of Hidalgo's rising had held the important post of administrator of the Valenciana mine in Guanajuato. He threw in his lot with the rebels, raised forces, was commissioned a colonel in the Army of Independence, and took an active part in the defense of Guanajuato. Fabie had come from the Philippines and graduated from the School in 1807; he did his practical work in Guanajuato and had only just taken his professional examinations in March 1810, returning thereafter to Guanajuato. Daviles had finished his studies at the School in 1805 and had done his practical work in Real del Monte and Guanajuato; he had been named acting professor of mathematics in the College there in 1806, and like Chovell took an active part in the Army of Independence serving as director of artillery and ordnance. All three of these former students were apprehended and executed by Calleja between November 26th and 28th, 1810.<sup>144</sup> Whether the alignment of these three men — all of them well trained and at least two of them holding excellent positions — with the rebels, was due to the infection of local feeling in Guanajuato, or was representative of the sentiments of the alumni is hard to say. There seems to be little doubt, however, that the majority of the personnel in the School itself supported the government. Besides the case of Tejada we find a petition from the Tribunal to the Viceroy on February 15, 1811, that all the students of the School serving in the

<sup>143</sup> Bancroft, *History of Mexico*, IV, 97-228.

<sup>144</sup> Ramirez, *op. cit.*, pp. 217-219.

volunteer "Batallion of Patriots" be brought together in one company.<sup>145</sup>

These events, and the temporary interruptions which they caused, undoubtedly upset somewhat the routine of the School. Ramirez makes no mention of public examinations after 1809; yet it seems probable that this was simply an omission on his part as there is plenty of evidence to show that the courses continued and the School went on. For example, on March 28, 1811, the Tribunal inspected the new building being constructed under the direction of Don Manuel Tolsa, and although it was not yet finished, decided that the School should move in so as to save the rent which was being paid.<sup>146</sup>

What probably did happen was a reduction in the number of students due to the disorders in various mining centers and military service, and a doubling up of courses by various professors. On December 23, 1811, the Tribunal suspended for the time being the admission of new students, and during the first months of 1813 it tried in vain to have the Viceroy exempt students from military service. On October 30, 1813, the Tribunal acknowledged receipt from Elhuyar of the reports on the work of the students for the past year, and decided to suspend the public examinations and postpone decision as to the opening of the College for the following year.<sup>147</sup> On November 6th D. Lucas Alemán, later to be so distinguished a figure in Mexican life and letters, wrote asking for a certificate from the professors of mineralogy and chemistry, which courses he said he had pursued during the years 1812 and 1813. Early in 1814 the director sent to the Tribunal as usual the list of students enrolled and their distribution among the various courses. There is also evidence that in this year the School was occupying its new home, as on December 21st the Viceroy wrote ask-

<sup>145</sup> *Ibid.*, p. 220.

<sup>146</sup> *Ibid.*, pp. 220-221.

<sup>147</sup> *Ibid.*, pp. 227-230. As we will see in the next chapter, the Junta General which met in 1813 considered suspension of the School to save its expense to the Tribunal, whose income was seriously curtailed by the Revolution.

ing the Tribunal to decorate the building for a ball to be held in honor of the return to Spain of Ferdinand VII. The Tribunal answered, expressing surprise that the School should be used for such a purpose, but consenting to the use of those parts not needed for its regular functions.<sup>148</sup>

There is no data on any special developments during 1815, but in 1816 there are a number of indications of the continuation of the regular routine. On January 15th the deputation of Pachuca notified the Tribunal that one Tomás Ramón del Moral had completed his practical work and was ready to return to Mexico for his professional examination. On July 10th D. Andrés del Río was named professor of Spanish grammar and French in addition to his other duties, indicating the doubling-up that was taking place. At the beginning of the year 1817 five new students were admitted, among them Joaquín Velásquez de León de Guitián, son of the first director-general; and on October 22d it was decided to admit three more students at the beginning of the following year. There is no record of any events of note during 1817 or 1818, but in 1819 we find a number of former students who had been serving as acting professors being appointed to permanent chairs in chemistry and the two courses in mathematics. In 1820 the director sent the Tribunal the regular lists of the various classes and everything seems to have been proceeding in a fairly normal way. In November of this same year Andrés del Río was named one of the deputies from Mexico to the Spanish Cortes, and the Tribunal named two substitutes to take over his classes in mineralogy and French during his absence.<sup>149</sup>

Notwithstanding the growing tension, the School appears to have continued as usual during the early months of 1821 and even after the beginning of Iturbide's movement which resulted in independence. In May and June a *Junta General de Minería* was held — the last under the old regime. At this Don Miguel

<sup>148</sup> *Ibid.*, p. 231.

<sup>149</sup> *Ibid.*, pp. 234-245.

Septién was elected administrator-general and Don Tomás Alemán, deputy-general — as well as other consultores and conjuces. At a session of the junta held on June 30th a resolution was presented by the delegates from Oaxaca, Arizpe, Chihuahua, Piños, Anganueo, proposing as a measure of economy that the School be suspended until the mining industry was restored to a more flourishing state. The resolution was discussed, but no action taken. Apparently the School kept on, as there is a note of a number of students running away to join the Army of Iturbide and a decree of the Tribunal ordering their expulsion.<sup>150</sup>

After the signing of the Treaty of Córdoba on August 24th, and the entrance of Iturbide into the capital on September 27th, changes came rapidly. On October 22d Elhuyar attended his last meeting of the Tribunal and presented his resignation as director after a period of over thirty-three years' service. This was accepted and the administrator-general Septién was appointed to take charge of the School. On the 25th all the members of the Tribunal, the staff of the College, and the five students remaining took the oath of allegiance to the new Independent Government.<sup>151</sup> On November 9th Elhuyar delivered to Septién all the papers, records, and other objects belonging to his office and thus closed his long career.<sup>152</sup> A month later Don Manuel Esnaurrizar, son-in-law of Professor Andrés del Río and his attorney during his absence, presented to the government a petition soliciting del Río's appointment as director of the College to succeed Elhuyar, pointing out that he was the senior professor and exceptionally well qualified for the position.<sup>153</sup> In due course Professor del Río did receive this appointment and the College continued in much the same way as before. With the return of relative peace and prosperity to the

<sup>150</sup> *Ibid.*, pp. 246-247.

<sup>151</sup> *Ibid.*, pp. 247-248.

<sup>152</sup> *Ibid.*, p. 248.

<sup>153</sup> *Ibid.*, pp. 248-249.

mining industry it expanded and, under a series of able directors, all of whom were alumni, played an important part in the life of the country up to 1867, when the law establishing the National Preparatory School took away most of its functions and left it to die. But it is not our purpose to trace its later history, and, with the resignation of Elhuyar and the coming of independence, we may ring down the curtain on the history of this institution.

Before attempting to evaluate the significance of the School, and the facts which have been presented, there is one phase of the subject which has only been touched upon briefly and deserves some further attention. This is the activities and careers of the graduates of the School after they had taken their professional examinations and received their degrees.

We have seen that a number of them returned to continue their studies and become assistants to the various professors, several of them working up to professorships themselves. As indicated above, one of the former students became administrator of the Valenciana mine — perhaps the outstanding professional mining position in the whole country — and another occupied a teaching position in the College in Guanajuato. There were undoubtedly other instances of alumni becoming administrators of individual mines or groups of mines, but of these we have no record. According to Art. 14, Tit. 18 of the Ordinances, the principal object of the School was to train boys to discharge the duties of mining and metallurgical engineers, and the Ordinances themselves laid down extensive duties and opportunities for employment for these engineers. Title 17 of the Ordinances is entirely devoted to these engineers, their qualifications and duties. According to Art. 1 each real was to have a mining engineer and a metallurgical engineer who were semi-public officials. Article 10 of this Title stated clearly that it was the royal intention that these posts were to be filled by graduates of the School, and gave the conditions under which, until there were enough of these alumni, practical engineers



would be examined and licensed. A reading of this Title and Title 9 will show that these engineers had many important duties. All surveyors, foremen, and superintendents had to be examined by them; in certain types of mining operations, particularly those relating to the safety of a mine, the owner was required to act under the supervision of an engineer and in many legal matters the testimony of the engineer was final. One of their most important duties was that of making an annual *visita*, or inspection, of each mine in the district in company with the mining deputies.

With the number of mining camps there were in the country, it is clear that the provision of engineers for even a half of them would have given employment to the graduates of the School for a considerable number of years. Unfortunately we have no direct evidence of just how many of the alumni filled these posts nor where they went. There is, however, some evidence that these positions continued to be considered as the principal destiny of the students after the School had actually started and begun turning out graduates and this will come out below.

According to Art. 9 of Tit. 17 of the Ordinances the fees to be collected by the engineers for their various duties, and especially for the annual inspections, were to be in accordance with a schedule to be drawn up by the Tribunal with the advice of the provincial mining deputations and the approval of the Viceroy. The formation of this schedule was not begun until 1794, or until the time began to draw near when there would be graduates of the School to occupy the positions; and due to numerous bureaucratic delays the final approval of the Viceroy was not given until 1805. Since the material on this topic is very complete, some consideration of it is worth while from several points of view. It shows what the students of the School might expect to earn as a result of their training, and at the same time throws some light on economic standards of the time; it also illustrates very well the manner in which the colonial bureaucracy functioned.

On March 2, 1791, the Tribunal sent to all the mining deputations a questionnaire asking for information as to the scale of charges made by lawyers, clerks, and engineers for various services in connection with mining, such as the registry and surveying of claims, surface and interior examinations, appraisals, advice as to timbering and ventilation, and so forth. During the next few years returns were received from most of the districts, showing a great variation in the scale of charges by the engineers. These fees ranged from two or three pesos to twelve pesos for a simple survey in the poorer reals up to three hundred pesos for a thorough examination in Guanajuato. Catorce was the only district having a fixed tariff of charges, with a charge of twenty-five pesos for an ordinary title survey, and fees for interior surveying and examination based on a regular scale according to the depth and area of the mine. While they left a wide scope for choice, these replies taken all together did give the Tribunal a pretty inclusive idea of the fees collected throughout the country for the various operations.<sup>154</sup>

About the time at which it returned the questionnaire, the deputation of Guanajuato petitioned the Tribunal that a levy of two reals in the marc of silver be collected for the benefit of the local deputations to pay the expenses of the clerks and engineers for the annual mine inspections — which thus far had not been made because of lack of any common funds to bear the expenses. The Tribunal found that this would be impossible for the time being because of the burden of the amount being collected on account of the loans and gifts to the crown, and nothing further was done. The Guanajuato deputies wrote again on June 27, 1794, recalling the above and saying that the situation was serious and some other scheme would have to be worked out. They suggested that the Tribunal set a fixed scale of fees for the clerks and engineers for mine inspections, and

<sup>154</sup> This information is based on an "extracto" made by the Secretary of the Tribunal on May 24, 1796, which gives summaries of the replies of all the Reals: — *A.G. Minería*, vol. 74, ff. 69-72.

that in the case of producing mines these charges be paid by the mineowners themselves; in the case of non-producing mines the whole local Mining Guild might bear the expense and be reimbursed from the first fruits of the mine. In conclusion, the deputies stressed the importance of making these inspections in accordance with the Ordinances, and promised their hearty coöperation with the Tribunal.<sup>155</sup>

After its secretary had prepared the summary of the replies of the deputations, the Tribunal formulated a complete tariff of charges to be made by engineers for various operations. This was forwarded to the Viceroy with a covering letter of July 19, 1796. In this letter the Tribunal recounted the sending out of the questionnaire in 1791 and the receipt of the answers according to the summary enclosed. Attention was called to the utter lack of any system or uniformity and the necessity of providing a definite schedule both for the protection of the miners and the engineers. It said that these returns had been examined carefully in accordance with Art. 9, Tit. 17 and on the basis of them and its own judgment the accompanying schedule had been drawn up and was submitted to the Viceroy for his approval.<sup>156</sup>

The following is a summary of the schedule of fees as drawn up by the Tribunal and submitted to the Viceroy.<sup>157</sup>

(1) For the inspection of an old or new mine, as required by Tit. 6, Arts. 4 and 8., and a survey of the surface area at the time of giving possession to the *denunciante*: — \$20 if the mine were within one league of the center of the Real, and beyond this an extra peso as mileage for each league travelled going and returning.

(2) For an ordinary visit to the surface of a mine to check the boundaries, etc.: — if one measurement were necessary, \$8.00; if a complete survey, \$12.00; if a map were required, \$20.00; with mileage as above.

(3) For interior examinations: — for a simple inspection without

<sup>155</sup> *A.G. Mineria*, vol. 24, ff. 86-87.

<sup>156</sup> *Ibid.*, ff. 75-76.

<sup>157</sup> *Ibid.*, ff. 73-74.

measurements, \$15.00 for the first hundred varas of vertical depth and \$10.00 for each succeeding hundred varas, including in this any examination of the drifts or stopes off of the same shaft and in the same *pertinencia*, but if it were necessary to go to another *pertinencia*, \$6.00 extra might be charged.

(4) If it were necessary to make interior measurements, the *perito* might charge in addition to the above, one real for each linear vara measured by the shortest route.

(5) If a map be required with horizontal plan and vertical section, an extra real might be charged for each vara measured.

(6) If the *perito* came to a mine to make an examination and there had been some misunderstanding as to the task, necessitating other instruments or making it impossible for him to do the job at the time, he might make a "service charge" of \$5.00 plus mileage as in Paragraph one.

(7) In the case of inspections in accordance with Title 9, Art. 10 (the *visitas de minas*) a fee of \$10.00 could be collected in addition to the charge for measurements and mileage, and this might be increased for special work.

(8) In cases of a superficial appraisal of a mine including an examination of the machinery, timbering, etc., a charge of three pesos for each morning or afternoon spent on the job in addition to mileage.

(9) In cases of a detailed and expert appraisal necessitating going into the mine, estimating ore-bodies, measuring drifts, inspecting the timbering, etc., a basic charge of \$50.00 with extra for additional depth or more than one shaft as in Paragraph 3.

(10) *Peritos Beneficiadores*, or metallurgical engineers, were to receive a fixed fee at the rate of five pesos per day for assays or any other operations requiring their services.

(11) In districts where there was no licensed *Perito Facultativo* or *Perito Beneficiador* and it was necessary to employ an intelligent practical engineer in accordance with Tit. 9, Art. 2, he should receive one half of the above fees in each case.

This last paragraph was explained in the covering letter as having been adopted to encourage engineers to qualify themselves for licenses, to raise the standards of engineering practice, and to provide wider opportunities for graduates of the School.

The question as to whether or not these fees were low, ade-

quate or generous — whether in a word they provided an attractive career for a young man — is hard to decide. Certainly they appear very small in relation to the fees received by competent engineers today. But when one takes into account the difference in the value of money and the scale of living at that time, they appear adequate. Clearly the income which an engineer would receive in a year would depend on the number of jobs he had and the activity in the district. Furthermore, the Tribunal did not expect anyone to depend solely on these fees for his livelihood, but expected them to be supplementary to a more or less steady private job.

After it was drawn up, this schedule was enmeshed in a maze of official bureaucracy, from which it did not escape until 1805. The details of its history during these years need not detain us; suffice it to say that it was passed back and forth between officials and engineers for their opinions, while the Mining Guild and particularly the deputation of Guanajuato clamored for a decision. Finally, late in 1804, after the file had lain dormant for five years, the civil fiscal resuscitated it and sent it to the Viceroy in exactly the same form in which it had first been drawn up in 1796.<sup>158</sup> On July 5, 1805, the Viceroy issued a decree approving the schedule and ordering its return to the Tribunal for printing and circulation.<sup>159</sup> With the Tribunal's acknowledgment on July 27th of its receipt of this decree and the schedule with the Viceregal approval, the story of this matter comes to a belated close.<sup>160</sup>

This affair shows us that there was great need for trained engineers to carry out official duties and that the School was almost the only important source of supply. The fees which

<sup>158</sup> The documents recounting the long history of this expediente are in *A.G. Minería*, vol. 24, ff. 76b-107b.

<sup>159</sup> *Ibid.*, f. 147.

<sup>160</sup> *Ibid.*, f. 146. On June 27, 1805, the Viceroy had written the King, giving a brief summary of the course of this expediente enclosing copies of the principal documents, and informing him of his intention to approve the schedule. *A.G. Virreyes*, Ser. II, vol. 12/224, No. 814.

they were to receive appear low to us and appeared so to three professional engineers to whom the schedule was submitted at the time; but it seems quite possible that an engineer could take in from \$500 to \$1000 in fees from official duties in the course of a year in an average real, and this, added to the salary which he might be expected to receive from private employment, would provide quite a respectable income for the period. Finally, from a remark made by the fiscal of the Tribunal in his reply to the engineers that the demands of miners all over the country for graduates of the School far exceeded the supply, we can be sure that opportunities for private employment were not lacking.

In addition to this private employment, the opportunities for performance of the official duties covered in the schedule, and the positions taken over in the School itself, other openings for its graduates were provided from time to time. Thus a royal order of February 19, 1798 provided that the positions of *Director de Minería* in Guatemala, Peru, Chile, and Buenos Aires should be filled by graduates of the School of Mines of Mexico.<sup>161</sup> Similarly on the 28th of January 1821, the King ordered that a graduate of the School of Mines in Mexico be chosen to fill the post of superintendent of the royal quicksilver mines of Huancavelica in Peru, although this order probably came too late to have much effect.<sup>162</sup>

Thus we come to the end of this phase of the activities of the *Tribunal de Minería*. We have seen the belated beginning of the School of Mines under the enlightened guidance of Fausto de Elhuyar, and something of the process of acquiring a trained faculty and adequate equipment. Likewise we have traced the subsequent functioning of the School in practice, and the training it gave, and seen its graduates returning to teach or going forth to occupy such important posts as administrator of the Valenciana mine. Earlier in the chapter we gave some atten-

<sup>161</sup> *A.G. Cédulas*, vol. 169, No. 126.

<sup>162</sup> *A.I., sec. 5, Aud. de Méx.*, Leg. 2250, expediente B2.

tion to the work of the German engineers and miners sent over to aid in introducing the latest European technological improvements to Mexico.

On the whole, this is one of the most satisfying phases of the Tribunal's activities. It represented real accomplishment and activity which was of lasting importance to the country. One should not, of course, make the mistake of overestimating the significance of the School in the contemporary life of the country. During these first years in particular its enrollment was never large and its graduates certainly effected no profound revolution in the mining industry of the nation. They did, however, form a group of trained engineers and scholars, a surprising number of whom played an important role in their country's history in the years following independence.<sup>163</sup> It must have been of great assistance to the struggling young nation to have this nucleus of leaders trained in the country's important industry. But the most satisfying reaction one has to these educational activities comes not so much from the sphere of material accomplishment as from the spirit of enlightenment which seems to have inspired the whole undertaking. The sending to Mexico at the crown's expense of the German experts was an example of this — although naturally it was prompted by intelligent self-interest as the royal treasury stood to benefit from any increase in the production of gold and silver. We have already emphasized the realistic conception of the School and its curriculum and the efforts to adapt it to the practical needs of the country. All of this reflects credit not only on the active participants but also on the royal government for its truly liberal attitude in promoting the welfare of the School and the industry in general. Furthermore, except for minor instances, there seems to have been little of that official jealousy, suspicion, and deadening *pie de plomo* which since the days of Philip II had characterized so much of Spanish administrative history. Of course the dominating figure in the whole

<sup>163</sup> Cf. the "Prólogo" to Ramirez's work on the School.

story is that of Fausto de Elhuyar. His broad grasp of the problem, administrative ability coupled with profound learning and practical experience, and courage to do and demand what he knew to be right, command tremendous respect in this as in the other fields where his influence was felt. Then, too, his power of inspiring loyalty helped greatly in building that *esprit de corps* so desirable in any institution of this type. The Tribunal likewise deserves credit for the time and interest it devoted to the School and the splendid manner in which it supported the director. Although at times in the study of the *Tribunal de Minería* one feels discouraged, and to some extent disillusioned, the subject matter of this chapter affords a heartening sense of public-spirited effort and vigorous execution.



## CHAPTER VIII

### LATER HISTORY OF THE TRIBUNAL AND MINING GUILD

IN THIS FINAL CHAPTER we will carry the story of the Mining Guild through its later years, touch upon the effects of the revolution on the mining industry and the Tribunal, and attempt to draw some general conclusions as to its importance and the manner in which it fulfilled the objects of its creation. The preceding chapters have described its activities in various fields and some of the problems it faced up to the early years of the nineteenth century. Considerable light is shed on its effectiveness during the later years by opinions and evaluations incident to efforts to revive the mining industry from 1815 to 1818. Before taking up this subject there is one field, neglected since 1787, which should be brought up to date. This concerns the financial affairs of the Tribunal, the manner in which it administered the Mining Fund, and the financing of mines.

Through the accounts demanded of the Tribunal, as part of the reorganization of 1786-1793, it was possible to present a fairly complete picture of its financial affairs up to 1787. Unfortunately, we have no such complete records for the subsequent years; hence the later history must be reconstructed from some fragmentary accounts and other indirect evidence. The dominating feature of this period was the ever mounting burden of loans and gifts to the crown, which eventually brought the Tribunal to the verge of bankruptcy. The heavy drain on the Royal Treasury caused by the Napoleonic Wars, following all too soon on the war with England of 1777-1783, caused the Spanish Crown to rely more and more heavily on the richest of its American colonies, and, as in the earlier years, the *Cuerpo de Minería* proved to be a fertile source of funds. The reason for this was not so much the wealth of the Tribunal or mining in-

dustry, but the fact that with an assured income for the payment of interest the former was able to borrow easily from private individuals and corporations. In fact, until the final debacle, the credit of the Tribunal stood higher than that of the Royal Treasury itself.

In Chapter III we described the earlier gifts and loans to the crown, including the \$1,000,000 advanced in 1782 to aid in financing the war with England. We also mentioned the efforts made by the Tribunal in 1785 to have this loan repaid and the promise of the government that \$500,000 would be paid at the first opportunity. On June 9, 1785, the *Audiencia Governadora* informed the Tribunal that it had instructed the Treasury officials to pay half of the million peso loan from the first funds available.<sup>1</sup> In effect, the sum of \$210,000 was paid to the Tribunal in November of that year, with the promise that the balance would be forthcoming as soon as funds came into the Treasury.<sup>2</sup> But when the money was available the Treasury preferred to use it for other purposes, until early in 1787 the Tribunal once more brought its case to the Viceroy's attention.<sup>3</sup> On February 13th the Viceroy informed the Tribunal that he had ordered the Treasury to make a partial payment of \$190,000 immediately and the balance as soon as possible.<sup>4</sup> Notwithstanding this, the Treasury refused to pay and in March 1788 the Tribunal wrote that it lacked funds with which to pay the interest due in April, and that if the balance due it were not paid promptly the Treasury itself would have to be responsible for the interest.<sup>5</sup> The fiscal of the Hacienda took strong exception to this view and said that the extra tax of four grains on the marc of silver, discontinued in 1785, could be reestablished.<sup>6</sup>

<sup>1</sup> Cf. above, chap. iii.

<sup>2</sup> Reported by Flores to Valdés in his No. 638, Oct. 27, 1788, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2241, expediente 6.

<sup>3</sup> *Ibid.*

<sup>4</sup> *A.G. Minería*, vol. 48, expediente 6.

<sup>5</sup> Flores to Valdés, Oct. 27, 1788, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2241.

<sup>6</sup> *Ibid.*

The assessor-general agreed that the Treasury could not be responsible for the interest, but stated plainly that the Tribunal was entitled to prompt repayment of the principal.<sup>7</sup> After some further correspondence with the Tribunal, Flores brought the matter before a *Junta Superior de Real Hacienda* on September 23, 1788. Here it was decided first, that \$290,000 should be paid the Tribunal immediately, the latter to use the whole of it toward paying off the individuals from whom it had borrowed the original \$1,000,000; second, that the balance of \$500,000 should be paid in five annual installments beginning January 1, 1790; and third, that for the payment of interest, the extra tax should be reestablished on all silver entering the mint, but that it should be two grains in the marc until \$250,000 had been paid, and one grain thereafter.<sup>8</sup> Apparently this decision was carried out, but it did not satisfy the Tribunal. On October 27th the latter addressed a letter directly to Valdes reporting this action and saying that it had used the whole \$290,000 to pay off part of the principal which it had borrowed. It said that the reimposition of the extra impost on silver was a great hardship to the miners who already had paid heavily to support the interest on this loan from which the crown had benefited. Therefore the Tribunal urged that either the remaining \$500,000 be paid off immediately or the Treasury assume the payment of all interest accruing since April 6, 1788, thus relieving the miners of the burden.<sup>9</sup> The King, however, saw fit to approve the action of the *Junta de Hacienda* and Viceroy, with the proviso that if funds were available the whole amount should be paid off without waiting for the annual installments to become due, so that the miners might be relieved of the extra burden as soon as possible.<sup>10</sup>

The difficulties of the Tribunal in collecting the balance due

<sup>7</sup> Viceroy to Tribunal, July 3, 1788, *A.G. Minería*, vol. 18, expediente 7, f. 204.

<sup>8</sup> Reported by Flores to Valdés, Oct. 27, 1788, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2241, expediente 1.

<sup>9</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2241, expediente 1.

<sup>10</sup> Valdés to Viceroy, Apr. 6, 1789, *A.G. Cédulas*, vol. 142, No. 199.

were far from ended. When the time came for the first installment to be paid on January 1, 1790, the Treasury officials wrote asking the Viceroy if they should pay it, and he told them not to do it until he gave orders to that effect. Thereupon the Tribunal wrote him that the Treasury had refused payment in spite of its requests and begged Revillagigedo to see that they received the \$100,000 promptly. The fiscal advised the Viceroy that it should be paid, and on January 13th he wrote the Tribunal that he would take the necessary measures. By February 19th it was still not forthcoming and the Tribunal wrote the Viceroy a second time calling upon him to see that the King's wishes were carried out. He replied rather sharply on the following day that there was no need for the Tribunal to remind him of the royal order and it would get its money in good time.<sup>11</sup> Presumably it was paid eventually as we hear no more about this installment nor the one due in 1791. In 1792 the results were not so fortunate. On January 9th the Tribunal wrote Ravillagigedo that on applying to the Treasury its fiscal had been informed that the installment due could not be paid without the Viceroy's order. This same letter said that the balance outstanding amounted to \$250,000, indicating that in one of the preceding years an extra fifty thousand pesos had been paid.<sup>12</sup> On January 11th the Viceroy replied that he was sorry but the condition of the Treasury did not permit of any payment at that time.<sup>13</sup> This is the last evidence we have of efforts on the part of the Tribunal to collect the balance of the loan or of any gesture on the part of the crown to pay it. We know, however, that in 1798 the \$250,000 was still unpaid.<sup>14</sup>

Of more importance than these efforts of the Tribunal to col-

<sup>11</sup> *A.G. Minería*, vol. 48, expediente 9, Nos. 29-35, ff. 350-359.

<sup>12</sup> *A.G. Minería*, vol. 49, expediente 2, No. 9, f. 260.

<sup>13</sup> *Ibid.*, No. 10, 261.

<sup>14</sup> *Nota de las Cantidades de pesos que el Real Tral. Gral. de la Minería ha desembolsado en donativos gratuitos y pago de renditos de las que tiene Suplidas a su Magestad*, Mexico, 10 de Feb. de 1798, *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2246, expediente 5.

lect the balance due it were the demands of the crown for further advances during these same years. Mention has already been made of the request of November 25, 1785 for \$100,000, and the lack of enthusiasm with which the Tribunal responded.<sup>15</sup> The request was repeated in a dispatch to the Viceroy of January 15, 1787,<sup>16</sup> which was acknowledged by the audiencia on May 25th, with the assurance that the necessary steps were being taken.<sup>17</sup> The Tribunal was still recalcitrant and on June 22d informed the audiencia that the state of its funds did not permit it to make a gift of \$100,000 at that time; this reply the audiencia acknowledged on June 28th, simply saying that it had been forwarded to the King.<sup>18</sup> In view of the financial condition of the Tribunal at this time as disclosed by the arreglo, the attitude of the Tribunal is not surprising. Although it accepted the excuse for the time being, the attitude of the government is less understandable. In January 1787 it was fully aware of the condition of the funds of the Tribunal; in fact, strict orders had been issued for the suspension of mine-financing and prohibiting all expenditures not absolutely necessary; yet while doing all this the crown repeated a request for the substantial sum of \$100,000, and, as we shall see, this was not all. The government was not to be put off permanently either by the refusals of the Tribunal or the state of its finances and in 1790 returned to the subject. On February 1st Valdés addressed a dispatch to the Viceroy, which recalled the two earlier requests; he said that in view of the conditions existing at that time the King had graciously consented to postpone collection of the money requested, but that he felt that the situation had improved sufficiently in the three years so that the Tribunal could afford the gift. Therefore the Viceroy was instructed to "use the means which his prudence should dictate and which might be the most

<sup>15</sup> Cf. above, p. 100.

<sup>16</sup> *A.G. Cédulas*, vol. 138, No. 88.

<sup>17</sup> Aud. Gob. to Marqués de Sonora, *A.G. Virreyes*, Ser. II, vol. 1/141, No. 88.

<sup>18</sup> *A.G. Minería*, vol. 48, expediente 6, No. 18.

efficacious and tactful to make the contribution effective . . .”<sup>19</sup> We do not know just what “prudence” the Viceroy used, but this time it was effective; on October 26th Gardoqui wrote Revillagigedo acknowledging the latter’s report that the Tribunal and Consulado had each agreed to contribute \$100,000, and expressed the King’s gratitude.<sup>20</sup>

This gift of \$100,000 lost significance in the next few years when the Tribunal had to assume far heavier burdens. In 1793 the Tribunal loaned the crown \$1,000,000 and in the following year made another loan of the same amount. We do not know the details of the first, as the only mention we have of it is in a dispatch reporting the offer of another \$100,000 by the miners of Guanajuato. On August 30, 1793, Revillagigedo wrote to Gardoqui that the miners and merchants of Guanajuato had offered to make a gift of \$100,000 to the crown as a contribution toward the expenses of the war, proposing to pay for this by placing an impost of three grains in the marc on all silver produced in Guanajuato. This would be on top of the nine grains which was already going to the Tribunal,<sup>21</sup> and would bring the tax up to the full real formerly charged by the crown as double seigniorage. The miners of Guanajuato had taken this action, the Viceroy said, before they knew that the Tribunal had already pledged \$1,000,000 in the name of all the miners of the country, which loan would require an extra impost of three grains in the marc on all the silver of the country to take care of the interest. Hence the Viceroy pointed out to Guanajuato that if they went ahead with their own gift they would have to pay for this as well as their share of the general tax, and gave them an opportunity to withdraw the offer. Guanajuato did not wish to bear the two burdens and asked that its own gift be accepted and that it be exempt from the tax

<sup>19</sup> *A.G. Cédulas*, vol. 145, No. 91; in this order, as well as in the earlier ones, the Consulado was to be invited to contribute another \$100,000.

<sup>20</sup> *A.G. Cédulas*, vol. 147, No. 123.

<sup>21</sup> Eight grains as the regular endowment tax and the one extra to pay the interest on the \$250,000 still unpaid of the earlier loan to the Treasury.

for the interest on the \$1,000,000 loan. This, however, was refused as being unfair to the other mining camps. Finally a compromise was worked out whereby Guanajuato was to collect the three grains on all its own silver. Out of this it would guarantee its share of the general expenses and use the balance to finance a slightly smaller gift to the crown.<sup>22</sup> Thus in 1793 the royal government received \$1,000,000 from the Tribunal and something under \$100,000 from the miners of Guanajuato.

The demands of the crown continued to grow heavier and with them the pressure on the Treasury of Mexico for more and more funds. Early in 1794 Revillagigedo wrote that it was impossible for the Treasury to continue to send large sums to Spain as it was becoming difficult to meet the expenses of the government of New Spain.<sup>23</sup> Upon taking office, the new Viceroy, Branciforte, had confirmed this state of affairs, but nevertheless promised to do what he could to send a substantial contribution to Spain.<sup>24</sup> Under these circumstances the Tribunal and the Consulado were once more the bodies approached. On July 24, 1794, Branciforte wrote to each of them, calling attention to the heavy expense of "the just war in which we are with France to resist the depraved activities of the factious party which tyrannizes it . . .," and the urgent pleas of the King for more money. In these circumstances he expressed confidence that the Tribunal and Consulado would again demonstrate their patriotism by contributing as much as they could.<sup>25</sup> On August 16th the Tribunal replied that it had considered the matter several times and discussed it with the advisors. At first it had not seen how it could contribute further, considering the heavy burden the miners were already under because of earlier loans and gifts, the contributions of many

<sup>22</sup> A.G. Virreyes, Ser. II, vol. 17/170, No. 616.

<sup>23</sup> Revillagigedo to Gardoqui, Mar. 21 and May 2, 1794, A.G. Virreyes, Ser. II, vol. 21/174, Nos. 911 and 953.

<sup>24</sup> Branciforte to Gardoqui, June 31, 1794, A.G. Virreyes, Ser. II, vol. 1/177, No. 33.

<sup>25</sup> A.I., Sec. 5, Aud. de Méx., Leg. 2245, expediente 6.

individuals and members of the Guild (such as Guanajuato), the lack of funds in its own treasury at the moment, and finally because of the current depressed conditions of the industry due to droughts. Later, however, it came to the conclusion that the urgent needs of the crown must come before its own interests. Therefore it decided to raise and contribute another million pesos, under two conditions. These were, first, that it be permitted to pay the interest out of its regular endowed income, diverting this from the purposes prescribed in the Ordinances (that is, *avíos*), except for the necessary expenses of the Tribunal and College; and second, that if lowered production should unfortunately reduce its income below the amount needed for interest payments, the Viceroy would agree to approve a recommendation for such further impost on the silver produced as might be necessary. In return, the Tribunal asked that the Viceroy recommend to the King the grant of certain favors which would help the industry.<sup>26</sup> Branciforte replied on August 22d, expressing profuse thanks, approving the terms on which the loan was made, and promising to recommend the favors when the Tribunal let him know what they were.<sup>27</sup>

The Viceroy reported all this to Gardoqui in a letter of August 31st, asking for the King's approval and at the same time recommending that favors be granted the Tribunal and some personal honors be given its ministers as a reward for their services.<sup>28</sup> The Minister replied on January 26, 1795 that the King had been pleased to accept the loan and approved the conditions, except that he would prefer to have the Tribunal impose an additional impost on the silver produced rather than divert its regular funds from their proper uses. Also he said the King would be pleased to consider the grant of privileges and honors but would have to know what the Tribunal and Branciforte had in mind.<sup>29</sup> Even before this dispatch had been received, the Tribunal had drawn up a representation

<sup>26</sup> *Ibid.*

<sup>27</sup> *Ibid.*

<sup>28</sup> *Ibid.*

<sup>29</sup> *Ibid.*



asking that, in return for its service to the crown, the price of powder be lowered.<sup>80</sup> This favor was granted in 1801,<sup>81</sup> but not until the Tribunal had made another gift to the crown. In the meantime the annexed list was drawn up, which shows very clearly the total of loans and gifts up to 1798, as well as the staggering burden of interest which they imposed on the funds of the Tribunal. As far as we can tell, the principal of none of the loans and gifts made after 1786 came from the funds of the Tribunal. Rather the latter borrowed from private individuals or corporations, pledging the income of the Mining Fund for the payment of the interest and in the case of gifts for the eventual retirement of the principal.

Nota de las Cantidades de pesos que el Real Tral. gral. de la Minería ha desembolsado en donativos graciosos y pago de reditos de las que tiene Suplidas a su Magestad.<sup>82</sup>

## DONATIVOS

En el ano de 77 dio trescientos mil p. <sup>a</sup> para ayuda de los gastos del Astillero de Goazacoalco . . . . .	0,300,000.0.0.
En el de 780 dono cien mil p. <sup>a</sup> al Serenísimo Senor Principe de Asturias actual Soberano . . . . .	0,100,000.0.0.
En el de 81 cinquenta mil a su Augusta Esposa la Reyna nuestra Señora . . . . .	0,050,000.0.0.
En el de 790 cien mil p. <sup>a</sup> a S M para ayuda de los gastos de la Paz con Argel . . . . .	0,100,000.0.0.
Importan los Donativos . . . . .	0,550,000.0.0.

## SUPLEMENTOS

Por el ano de 782 presto el Tral. al Rey un millon de pesos que tomo a reditos por no haverlo en sus Arcas; de cuiá cantidad recibio en abono la de 750 y se le restan 250 mil . . . . .	0,250,000.
En el ano de 793 suplio a S.M. otro millon pesos de que no se le ha reintegrado Cantidad alguna . . . . .	1,000,000.

<sup>80</sup> Tribunal to Gardoqui, Feb. 28, 1795, *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2246, expediente 5.

<sup>81</sup> Soler to Marquina, Apr. 27, 1801, *A.G. Cédulas*, vol. 179, No. 59.

<sup>82</sup> *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2246.

En el de 94 hizo igual Suplemento que aun se  
le debe . . . . . 1,000,000.

Importa lo que se resta de Suplementos . 2,250,000.

#### PAGADO DE REDITOS

Desde el citado ano de 77 hasta el de 88 como consta del Estado que el Real Tral. manifesto a la Junta gral. de Minería en el de 89 . . . . .	0,456,775.6.64
Desde este hast el de 93 segun el Estado presentado en el mismo a la propia Junta gral. . . . .	0,200,854.6.4.
Desde el de 93 hta. el de 96 conforme al Estado respectivo . . . . .	0,313,616.1.9.
En el ano proximo pasado de 1797 . . . . .	0,112,500.0.0.

Total del desembolso . . . . . 1,083,746.4.9.

Mexico 10 de Febrero de 1798.

No. 2

As indicated above, the totals appearing in the list of 1798 were not final. Late that year the crown again called on Mexico for financial aid and once more the Tribunal was the principal object of its importunities. The miners' organization offered to make a gift of half a million pesos, but only on the condition that the Viceroy permit an additional impost of three grains on each marc of silver for the payment of interest and redemption of the principal. Even this offer was made with misgivings, as the Tribunal pointed out that the industry was already heavily burdened by the charges incident to the earlier loans and its own treasury was empty. The Viceroy confirmed this condition and did not wish to take the responsibility himself of raising the tax. He felt however that in view of the necessities of the crown, the miners could afford the added burden and recommended that the King accept the gift on the conditions offered.<sup>33</sup> At the same time he recommended that permission be granted for Elhuyar's salary to be increased, as he had been the principal agent in persuading the Tribunal to offer the gift.<sup>34</sup> This does not put Elhuyar in the most favorable light; we know that he had

<sup>33</sup> Azanza to Saavedra, Nov. 26, 1798, *A.G. Virreyes*, Ser. II, vol. 1/192, No. 162.

<sup>34</sup> *Ibid.*, No. 164.

been seeking to have his salary raised for some time,<sup>35</sup> and, while he was entirely justified in this, it does appear that in urging the Tribunal to vote the gift to the King he may have been moved more by self-interest than patriotism or the well-being of the Mining Guild. The King accepted this latest gift on December 25, 1799, agreeing to the extra impost of three grains, with the exception that Guanajuato should be exempt from it until it had paid off the interest and principal on its own gift of \$100,000.00.<sup>36</sup> As we have seen, the grant of a reduction in the price of powder followed within a reasonable time after this latest gift.

This gift of \$500,000 in 1798 is the last direct loan or gift to the crown of which there is record. As we will see shortly, there were other extraordinary expenses which the Tribunal incurred which added to its burdens. Before leaving the subject of gifts and loans to the crown it is of interest to inquire how much was ever repaid. This is difficult to determine as we have only indirect evidence to go on. On February 20, 1808, the Viceroy Garibay wrote a dispatch to the Ministry which throws some light on the situation.<sup>37</sup> He said that on March 3, 1807 the Tribunal had petitioned his predecessor Iturrigaray that, in view of the serious embarrassment of its own funds, the Royal Treasury should take over the payment of interest on the \$2,000,000 loaned by the Tribunal in 1793-94, implying at the same time that there had been an understanding that each loan would be repaid in two years. The *Tribunal de Cuentas*, to whom the petition was referred, said that the repayment of these loans was at the discretion of the Treasury, and that if the latter had to pay the interest it did not see that the Tribunal could be credited with having been of any service to the crown. The fiscal of the Hacienda gave a similar opinion, but added that in the existing circumstances the Tribunal "should continue to

<sup>35</sup> Reported by Azanza on Sept. 28, *ibid.*, No. 116.

<sup>36</sup> *A.G. Cédulas*, vol. 174, No. 214.

<sup>37</sup> *A.G. Virreyes*, Ser. II, vol. 1/239, No. 13.

receive gratefully the \$10,000 which were being paid it monthly to extinguish the debt of two millions, until, under more favorable conditions, . . . the balance of the debt could be paid. . .”<sup>38</sup> Iturrigaray had approved this decision and Garibay sent it to the Ministry for its information.

One would infer from this that the Treasury was making regular payments of principal at the rate of \$120,000 a year. We do not know when these payments were begun, whether or not they were made regularly, or how long they continued. It appears probable that fairly regular and substantial payments were made, as an entry in the account presented to the Junta General by the Tribunal in December 1813, recorded that at that time the Treasury still owed \$682,769-4-3 on account of loans made by the Tribunal.<sup>39</sup> If we accept this figure at its face value and assume that the balance of all loans had been paid, we may, by adding the amount of the gifts, arrive at a figure which will indicate the final burden on the funds of the Tribunal by reason of the exigencies of the crown over the preceding thirty-five years. According to the account prepared in 1798, the total of gifts up to that date was \$550,000; adding the half-million given the following year we arrive at a total of gifts of \$1,050,000, which, added to the unpaid balance of loans as above, gives a grand total of \$1,732,769-4-3. Unless some further payments were made by the Treasury, which seems doubtful in view of the state of the country in these years, this figure represents the net amount of capital taken by the crown from the Tribunal and for which the fund of the latter was responsible. The interest on this capital, as well as on the loans which were paid back, more than doubled this figure. Up to 1798, the Tribunal had paid out \$1,083,746-6-7 in interest on the capital which it had borrowed to make these loans and gifts and was then paying at the rate of \$112,500 annually.<sup>40</sup> If

<sup>38</sup> Quoted by Garibay in the above dispatch.

<sup>39</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2237, expediente 8. cf. below, p. 384.

<sup>40</sup> Cf. the account of 1798.

anything, this annual charge increased later, as in the four years 1810 to 1813 \$527,096 was paid in interest.<sup>41</sup> To be conservative, we may assume that from 1798 to 1815 the interest charges on account of the money advanced the Treasury averaged \$100,000 annually, or a total of \$1,800,000. This gives us the following approximate totals:

Net principal of gifts and loans	\$ 1,732,769-4- 3
Interest, 1777-1797, inclusive	1,083,746-6- 7
Interest, 1798-1815, approximately	1,800,000-0- 0
Total	<hr/> \$ 4,616,516-2-10

This total represents the approximate cost to the *Fondo Dotal de Minería* of the demands made upon it by the crown between 1777 and 1815. It does not include the principal of loans which were repaid (some \$2,300,000); nor, on the other hand, does it take into account the fact that much of the capital borrowed by the Tribunal to make these loans was probably never paid back.<sup>42</sup> It seems fair to say that this figure does represent a sum which might otherwise have been employed for the benefit of the mining industry.

This brings us to a consideration of the effects of these loans and gifts on the Mining Fund and other general financial developments of the later years. It should be stated at the start that the demands of the crown left no surplus funds available for the financing of mines, and hence no attempt was made to carry out this important object of the Tribunal's creation after 1786. None was better qualified to judge the effects of the gifts and loans to the crown on the finances of the Tribunal than Fausto de Elhuyar and his opinion is best given in his own words, as written in 1813:

<sup>41</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2237, expediente 8.*

<sup>42</sup> In 1821 the Tribunal owed a total of \$3,624,165-2 in principal, as well as back interest of \$89,446 to over a hundred individuals, institutions, and foundations from whom the money had been borrowed, with the income from the mining fund as security; *A.G. Minería*, vol. 211, ff. 1-11.

After the publication of these [the Ordinances] in 1784, the financing of mines of individuals was begun with very little consideration, with the result that in a few months the surplus accumulated in the preceding years had been fruitlessly invested, and the Tribunal was burdened with a debt of \$325,000. After the Government had ordered the suspension of this financing, instead of devoting the surplus (income) to the retirement of this debt, it was applied for the most part to meeting the new interest on the millions which were successively furnished in the name of the *Cuerpo* to His Majesty; in spite of solemn promises that these would be repaid at the end of two years, no payment whatever was made for them, and it was with difficulty thereafter that monthly payments of ten or fifteen thousand pesos were extracted there still remaining a large amount to be paid. The investment of these loans on extraordinary objects (although the ones for which they were borrowed), and the new expenditures which circumstances have continued to demand have raised the debt of the Tribunal to the maximum that it can support. In this way, up to now its income has served rather as a recourse for the Government than as the fund which the miners hoped would be used for their (benefit). Notwithstanding this the credit of the Tribunal has constantly been maintained, meriting greater confidence than the other public funds of the country; and because of this it has always been able to obtain the capital it has needed at low rates. But the fatal consequences to it (the mining industry) arising from the lamentable insurrection in these provinces, which has destroyed the principal mining centers and crippled the industry generally, have resulted in sealing the decay of this useful establishment, making it impossible for it to fulfill its obligations at the present time, unable to pay its interest, having to suppress or reduce the salaries of its ministers and employees, and with the prospect that if the recovery of the industry is delayed it will not soon be able to come out of the slough in which it now finds itself. Such have been the fatal results brought about by the repeated demands of the Government, its (the Tribunal's) liberality in satisfying them, guided by the most noble sentiments, and the calamities of the present epoch.<sup>43</sup>

These loans and gifts to the crown so obviously diverted the Mining Fund from its original purpose that the point does not need to be labored further; but in forming any judgment as to

<sup>43</sup> Elhuyar, *Reflexiones sobre la Constitucion actual del Cuerpo de Minería, A.I., Sec. 5, Aud. de Méx., Leg. 2250, expediente 3A*; cf. below, p. 435.

the manner in which the Tribunal discharged the objects of its creation, it should always be kept in mind.

The financial history of the Tribunal in the later years was so dominated by these events, largely beyond its control, that it is doubtful whether we would gain additional knowledge of much significance even if we had the full accounts. All that we have is a fairly comprehensive statement of condition and balance sheet presented to the Junta General in 1814 and covering the four years, 1810 to 1813. This is not an accounting in the sense of showing in detail the income and disbursements of the Tribunal, but it does indirectly throw light on these subjects as well as showing the condition of the fund at that time. It also indicates some rather irregular expenditures reminiscent of those which came to light in the earlier account.<sup>44</sup>

This account showed that the Tribunal had a capital debt of \$3,805,800-5-2,<sup>45</sup> although as shown below, this did not include the current accounts payable. Against this debt there was an interesting list of capital sums owed to the Tribunal by various individuals and enterprises, as follows:

1. The Public Treasury on account of loans . . .	\$ 682,768-4- 3
2. The <i>Minería de Guanajuato</i> . . . . .	42,752-5- 5
3. The Conde de Regla . . . . .	30,000-0- 0
4. The Estate of Sr. Obregón . . . . .	80,000-0- 0
5. The Marqués de Rayas . . . . .	84,000-0- 0
6. From the entry in the book of taxes . . . . .	163,000-0- 0
7. Don Luis Martínez . . . . .	4,000-0- 0
8. Don Manuel Lozano . . . . .	2,241-0- 0
9. The Drainage (canal) of Huehuetoca . . . . .	200,000-0- 0
10. The Bridge of Zimapan . . . . .	92,027-3- 5
11. Of the balance against the Factor . . . . .	302,644-6- 9
12. Capital (value) of the Lease of Barrio . . . . .	10,000-0- 0
13. Capital value of the rented quarters of the School . . . . .	30,000-0- 0
<hr/>	
Total	\$1,723,435-3-10

<sup>44</sup> This account forms part of an *Expediente formado con los Actos de las Juntas Generales de Minería*, 27 dic. 1813-15 de abr. 1815, A.I., Sec. 5, Aud. de Méx., Leg. 2237, expediente 8.

<sup>45</sup> This was very probably made up in much the same way as the list of 1821 referred to in footnote 43.

It is not known just what is meant by Items 6 and 11; except that quite probably the latter represents a shortage in the accounts of the factor for which he was held responsible — as in the earlier case of the first factor Don Aniceto de Barrio, or even this earlier shortage still carried as an account receivable. Most of the other items seem to involve loans made by the Tribunal. This immediately raises the question for what purpose and with what justification these were made. Items 9 and 10 were probably loans to the government for the purposes indicated and would seem to have been fairly regular. But the \$200,000 owed by individuals was rather questionable. From other evidence it is clear that these sums were loaned to the individuals by the Tribunal when some of them, notably the Marqués de Rayas and the Conde de Regla, were members of it. It is probable that the loans were made to help the individuals over supposedly temporary difficulties arising from the first years of the Revolution. It also appears that Elhuyar criticized the loans and had tried to have them repaid.<sup>46</sup> Unfortunately the accounts throw no further light on the origin of these items, which were considered assets by the Tribunal. The total was, however, subtracted from the total capital debt to give a figure of \$2,082,365-1-4, which was described as the actual debt of the Tribunal itself whose principal and interest would have to be paid out of its own income.

There were also two other statements of current accounts

<sup>46</sup> On February 13, 1813, D. José de Finonta, acting for the Regency in Spain, sent an order to the Viceroy, Venegas, which referred to "el expediente sobre las quexas dadas por D. Fausto Elhuyar director de ese Tribunal de Minería acerca de los procederes del Marques de S". Juan de Rayas administrador general que fue del propio establecimiento, y demas socias, en la ilegal extraccion de caudales que hicieron de sus arcas . . ." (*A.G. Cédulas*, vol. 208, No. 2). Unfortunately this expediente is missing. It appears from this same order, however, that Elhuyar had made efforts in the Tribunal to collect the funds and had incurred the bitter opposition of the Marqués de San Juan de Rayas and his friends, who brought charges against him in connection with the running of the School. Venegas had pursued a pusillanimous course, first supporting Elhuyar and the Tribunal, and later telling Marqués that he could postpone payment of his debt. This order completely upheld Elhuyar and



payable and receivable. The list of accounts payable was as follows:

Interest for three years . . . . .	\$ 527,096-3-4
Pension to the Academy (of San Carlos), four years . .	20,000-0-0
Idem of the Marqués de Soñora . . . . .	32,000-0-0
Due the Five Guilds of Madrid . . . . .	17,793-4-0
Due D. Manuel Tolsa (architect for the School) . . . .	20,633-0-0
Total	<u>\$ 617,522-7-4</u>

This sum represented annual charges which the Tribunal had been unable to meet for the past few years and which had, as we shall see, brought demands from its creditors for some drastic action. To balance these there were also a large number of current accounts owing to the Tribunal. These included interest on the various capital sums owed the Tribunal, amounting all together to over \$175,000, and refunds due from the Treasury for sums advanced to pay freight on quicksilver. It was also estimated that there was \$248,610 due the Tribunal of its regular endowed income, collected by the provincial sub-treasuries but not as yet paid in.<sup>47</sup> Also included among the assets was the value of goods belonging to the Tribunal and either sold or for sale, a secured loan to another former member of the Tribunal, D. Marcelo José de Anza, for \$40,000, and other miscellaneous credits. As estimated by the factor these credits came to a total of \$798,863-9-2, leaving a paper surplus over the accounts payable of \$176,340-0-10. The committee appointed by the Junta General to audit the accounts felt that a number of these items represented very doubtful assets and reduced the total of current accounts receivable and probably

cleared him of the trumped-up charges brought against him, at the same time ordering the Viceroy to request restitution of the Tribunal's funds by those who had "borrowed" them.

<sup>47</sup> This sum was arrived at by estimating the total income of the Tribunal for the years 1810-1813 at three-fifths what it had been during the preceding four years. This gave an estimated total income of \$652,000 from which was subtracted \$403,390 already received, leaving the \$248,610 included as an account receivable. An examination of the coinage figures (Appendix A) shows that this was an optimistic estimate as the total silver coined in the years 1810-1813 was only slightly over half that coined in the preceding four years.

collectible to \$669,110-5-4, thus reducing the estimated surplus to \$50,530-1-0. The Tribunal insisted that the other items were collectible and that the junta took too gloomy a view of the situation.<sup>48</sup> Under the circumstances one cannot help feeling that the lower figure was the more realistic. One further account was presented to the Junta General — an estimate of future annual expenses, as follows:

Annual interest on the private debt of the	
Tribunal (\$2,082,365-1-4) . . . . .	\$104,118-2-0
Salaries of the Tribunal . . . . .	36,101-0-0
Expenses of the College . . . . .	20,000-0-0
Pensions . . . . .	9,500-0-0
Business agent or attorney . . . . .	1,000-0-0
Mass of Guadalupe . . . . .	500-0-0
Minor Expenses . . . . .	600-0-0
Extraordinary expenses . . . . .	1,200-0-0
<hr/>	
Total Annual Expense	\$172,069-2-0

The Tribunal noted that its annual income for the past four years had been estimated at \$163,000. It felt that with conditions gradually being restored to normal this income would be increased sufficiently to cover the annual expense comfortably and leave a surplus for payment of debts. However, even on the assumption that the accounts receivable would in reality take care of the current debts, and that the capital sums owed the Tribunal would be repaid in full, it would have required an annual surplus of \$100,000 for over twenty years to retire the capital debt of the Tribunal. The committee of the Junta General which in 1813 examined these accounts and estimates considered that the Tribunal had taken an overoptimistic view of the situation. After considering all the facts, it made its own estimates of income and expense, which were summarized in the tables annexed. These perhaps present a truer picture of the situation than do the figures of the Tribunal.<sup>49</sup>

<sup>48</sup> Cf. below, pp. 417-419.

<sup>49</sup> This junta general and the committee's report are discussed later in this chapter.

STATEMENT OF THE EXPENSES WHICH THE MINING FUND MUST MEET ANNUALLY ON ACCOUNT OF INTEREST ON THE CAPITAL FOR WHICH IT IS RESPONSIBLE AND OTHER FIXED CHARGES, AND THE ANNUAL INCOME WHICH IT MAY EXPECT TO COVER THEM\*

Estimated Annual Expenses			
Interest on the debt of . . .	\$ 950,584.0.0	at 4½% . .	\$ 42,776.2.0
Interest on the debt of . . .	2,845,216.5.2	at 5% . . .	142,260.6.0
Interest on the debt of . . .	010,000.0.0	at 6% . . .	00,600.0.0
	\$3,805,800.5.2		\$185,637.0.0
The pension which it pays to the Academy of San Carlos . .			\$ 5,000.0.0
The pension to the Marqués de Sonora . . . . .			4,000.0.0
The expenses of the Tribunal . . . . .			34,401.0.0
The expenses of the College . . . . .			22,552.5.0
Miscellaneous unforeseeable expense . . . . .			5,000.0.0
			\$256,590.5.0

Estimated Annual Income

Income from the 12 grains [on each marc of silver]:

After careful study we do not believe we can estimate this at more than half the ordinary income, and since this has been 260M in recent years, we compute it at . .		\$130,000.0.0
Interest on the 30M owed by the Conde de Regla . . . .		5,500.0.0
Interest on the 80M owed by Col. Ignacio Obregón . . .		4,000.0.0
Interest on the 84M owed by the Marqués de Rayas . . .		4,200.0.0
Interest on the 200M owed by the Huehuetoca Canal . .		10,000.0.0
Interest on the 92M owed by the Bridge of Zimapan . . .		4,600.0.0
Interest on the 4M owed by Don Luis Martínez . . . .		200.0.0
Interest on the 2,241 owed by Don Manuel Logaño . . .		112.0.7
Income from the outbuildings and ground floor of the College [rents?] . . . . .		1,500.0.0
Income from the house of Don Aniceto del Barrio . . . .		500.0.0

Total annual income . . . . .	\$160,612.0.7
Deficit to balance . . . . .	95,978.4.5

\$256,590.5.0

Mexico, 30 July 1814  
Francisco Alonso Terán  
José Maria Fagoaga

\* *A.I., Sec. 5, Aud. de Méx., Leg. 2237.*

As suggested above, these accounts although too fragmentary to offer the basis for any very definite conclusions, allow two or three observations of interest. First they show again the burden of the debt incurred by reason of the advances to the crown, and second, they indicate that the extreme care which this very fact should have caused in the handling of the funds was lacking. Notwithstanding the heavy debt that was beyond its control, the Tribunal did not hesitate to lend large sums to various individuals without much apparent justification, nor was it apparently able to prevent serious irregularities in the accounts of the factor. On the basis of this bit of evidence one wonders how successfully the Tribunal would have handled the financing of mines if it had been possible to renew that activity. We will return to some of the more general effects of the financial situation in our discussion of the attempts made in the final years to revive the industry and the Tribunal. There are first one or two other developments in this sphere which should be considered.

The first of these was a suggestion originally made in 1794 that Art. 1, Tit. 16 of the Ordinances be modified. This article imposed the tax of eight grains on the marc of silver for the benefit of the Mining Fund and provided that no one should be relieved of the obligation of paying it even though he were exempted from certain of the royal taxes. In recommending rejection of a request of one Juan Domingo González de Cosío for exemption from the quinto, Ramón de Posada, at that time fiscal of the Hacienda, suggested that the modification of this article be considered so that a miner could be exempted from the contribution to the Mining Fund under certain conditions. He felt that such a course would help the Treasury and also the miners by affording them a greater saving. The suggestion was referred to a *Junta de Real Hacienda* which approved and recommended approval of the change by the King.<sup>50</sup> The

<sup>50</sup> Revillagigedo to Cardoqui, May 31, 1794, *A.G. Virreyes*, Ser. II, vol. 21/174, No. 966.

latter, on the advice of the Council of the Indies, ordered that the matter be reconsidered by the *Junta de Hacienda* after consultation with the Tribunal and the fiscal of the audiencia.<sup>51</sup> This reconsideration took over ten years. The Tribunal opposed the idea very strongly, saying that the amount involved, equaling one-twelfth of the quinto, would be too little to make any appreciable difference to the miner, while if the practice became general it might be serious for the Mining Fund. Furthermore it said it would affect its own impartiality in recommending approval or rejection of requests for exemption from the royal taxes. The new fiscal of the Hacienda, Don Francisco Xavier Borbón, seconded the arguments of the Tribunal and added the further significant one that the Mining Fund was of great benefit to the royal treasury and its income should not be diminished. The audiencia, on the other hand, favored the modification of the article. It alleged that the Tribunal might be more, rather than less, impartial if its own income were to be affected by exemption of a mine from taxes. Likewise it felt that the saving to the miners, even though it were but one-twelfth of the quinto, would be appreciable over a period of years and might well make the difference between success and failure. The Council of the Indies after considering these opinions decided on August 27, 1807 that this section of the Ordinances should not be modified. It observed that it had never been the practice in granting exemption from royal taxes to exempt the individual from the payment of local imposts levied for particular purposes. Furthermore it repeated that the Mining Fund was of importance to the Treasury and nothing should be done to impair its income.<sup>52</sup> In accordance with this advice the King issued a formal decree on February 29, 1808, definitely disapproving the suggested modification and thereby closing the subject.<sup>53</sup> This affair is of some interest

<sup>51</sup> Real Cedula, dated June 19, 1795, *A.G. Cédulas*, vol. 161, No. 90.

<sup>52</sup> The above information is all included in the "informe" of the Council of the Indies, of Aug. 28, 1807, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2248, expediente Br.

<sup>53</sup> *A.G. Cédulas*, vol. 200, No. 47.

because if the modification had been approved it might have been the beginning of a series of efforts to cut into the revenue of the Tribunal. Furthermore, there is no evidence that the provincial deputations or individual miners — the ones who paid the tax — were consulted in any way. Finally it illustrates once more the feeling of antagonism between the Tribunal and the *audiencia*.

In closing this discussion of the later financial history of the Tribunal, mention should be made of the debt of the Tribunal in 1821.<sup>54</sup> The account shows a total principal debt of \$3,624,165-2-0; the reduction of approximately \$180,000 from the total listed in 1813 may indicate actual reduction of its own debt by the Tribunal or it may represent repayment of some of the loans made by the Tribunal to individuals. The latter is more likely, as the fact that the account of 1821 also shows \$89,446-5 due in back interest would indicate that the Tribunal had had no surplus funds for retirement of principal. On the other hand, it is clear that if any of the funds owed to the Tribunal had been repaid between 1813 and 1821, it was a small fraction of the total of \$1,723,435-3-10 listed at the earlier date. Inasmuch as these figures indicate clearly that the Tribunal still stood on the threshold of bankruptcy in 1821, it is remarkable that it was able to make as good a showing as it did in the last eight years of its life. While it is true that the production of gold and silver had risen somewhat from the low figures of the first years of the insurrection, it never approached the pre-revolutionary figures. Nevertheless, the back-interest owing in 1821 was less than that in 1813, amounting in fact to less than a single year's interest. Therefore it can be said that while the financial condition of the Tribunal on the eve of independence was desperate, it had succeeded in maintaining its credit under conditions which might well have justified complete default.

<sup>54</sup> A statement of this appears in *A.G. Minería*, vol. 211, ff. 1-11.

We are now ready to consider the effects of the events of 1808 to 1821 on the Tribunal and the mining industry. First of all it is of interest to determine the attitude of the Tribunal toward these events and the general subject of the revolution and independence. The fact that the personnel of the Tribunal changed during this period as well as the confusion of loyalties to King, constitution, Viceroy, the established order, and country, makes it a bit difficult to generalize. It seems clear, however, that throughout this period the sympathies of the majority of the Tribunal were with the conservative, clerical party striving to preserve the old order, whatever opportunistic shifts of loyalties that primary purpose involved. In the maneuvers of 1808 the Tribunal was split. Iturrigaray named Elhuyar and the administrator general of the Tribunal, the Marqués de Rayas, members of the provisional junta which met in the summer of 1808 to decide whether a national junta, composed of delegates elected from the various provinces of the country, should be convoked to govern New Spain in the name of the King. The Marqués de Rayas was one of those who favored this project most strongly and made his views known very clearly. Elhuyar's position is not made clear, but when the two deputies-general of the Tribunal, Marcelo José de Anza and José Antonio de Terán, learned of the administrator's stand, they feared that it would be accepted as the opinion of the Tribunal. Hence a meeting of the Tribunal was held at which the Marqués defended his views against the other two; while the latter decided to notify the Viceroy that the administrator's views were only his own and not those of the Tribunal. Unfortunately the *coup d'état* by the audiencia deposing the Viceroy in September 1808 or, as the Tribunal euphemistically put it, "the separation of the Viceroy from his command and the change in the government . . .," prevented fulfillment of the plan for a national junta. Thereupon the two deputies, Anza and Terán, wrote an explanation to the Regency protesting their own loyalty and emphasizing the fact that the admin-

istrator gave utterance to only his personal views. At the same time they emphasized that they did not question in any way the loyalty, patriotism, or motives of the Marqués de Rayas, but simply disagreed with his views as to the policy that should be pursued.<sup>55</sup>

It is clear from this that in the first crisis of the Revolutionary period the majority of the Tribunal sided with the reactionary forces of the audiencia and clergy against the suggestion of representative juntas. This conclusion is confirmed by a letter of the audiencia, enclosing the above representation which speaks highly of the patriotism of the two deputies and their loyalty to the King and the audiencia.<sup>56</sup> Later, after the insurrection had broken out, the Tribunal showed no sympathy with the rebels, but rather praised highly the efforts of the new Viceroy Venegas to stamp out the rebellion. On May 11, 1811 it addressed a representation to the Regency, praising in the most glowing terms the vigor of this Viceroy in restoring order and urging his continuance in office. This was signed by Elhuyar, José Mariano de Fagoaga, and Fermín Antonio de Apezechea and leaves no doubt as to the sympathies of the Tribunal.<sup>57</sup> Even though its membership had from the beginning been drawn more from the creoles than that of other royal tribunals, this attitude on the part of the *Tribunal de Minería* is not surprising. It was after all a royal tribunal enjoying favor and protection from the King. Furthermore we have seen that in general it did not invite the active coöperation of the provincial deputations and it could hardly have been expected to welcome a change in government that would almost inevitably lead to less centralization of authority. Finally the members of the Tribunal were for the most part the aristocrats

<sup>55</sup> The above is included in a dispatch of the two Deputies to the Regency dated Nov. 25, 1808, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2248, expediente D8.

<sup>56</sup> Audiencia to Regency, Nov. 26, 1808, *A.I., loc. cit.*

<sup>57</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2249, expediente A2; it is significant that the audiencia and clergy composed almost identical representations on the same day, cf. Fisher, *Background of . . . Mexican Independence*, p. 327.



of the mining fraternity — men of wealth, power, and privileged position who would have little sympathy with a liberal revolution.

Whether in adhering to this conservative attitude the Tribunal represented the feelings of the miners of the country, it is difficult to say. It is almost certain that all the more important mineowners would have agreed with the ministers of the Tribunal and highly probable that a majority of all the miners would also have agreed. The industry depended on order for its prosperity. The violence of Hidalgo's followers in seizing mines, and, not content with appropriating the available silver, rendering them incapable of future production for a long time to come must have given pause even to those miners who were dissatisfied with the inequalities and corruption of the existing regime. Even where the mines themselves were not disturbed, the chaotic condition of the country affected seriously the supply of goods necessary for the production of ore — and in particular the supply of quicksilver. When supplies were available, the price was prohibitive. Conversely it became very difficult for the miners to dispose of the silver which they did produce. Evidence of these facts will be presented below; here it is enough to say that all these factors would tend to throw almost all miners, even the poorer ones, into the ranks of those desiring a reestablishment of order and authority.

It is scarcely necessary to dwell at length on the effects of the revolution on the mining industry. The coinage figures reflect clearly enough the sudden drop from the former high level of production. The important mining centers of the country were among the first regions to feel the scourge of war. Guanajuato, Zacatecas, and San Luis Potosí had all been the scenes of violent battles before the end of 1810. In the next year the tide engulfed the newer regions to the north, while in 1812 Pachuca fell to the insurgents. Throughout the whole struggle the mining centers bore a heavy share of the fighting — which was natural since each side desired the silver of the

mines. Even when there was relative peace the damage already done continued to have its effect and communications with the capital were interrupted. Thus in December 1810 the Intendant of Guanajuato wrote the Tribunal that it would take at least \$1,000,000 to rehabilitate the mines of that important center, and suggested that the Tribunal advance this sum as avíos to various individuals of the Real. While the Tribunal was scarcely in a position to lend such a sum, it considered the situation of sufficient importance to ask for detailed information from the deputation of Guanajuato.<sup>58</sup> Again in July 1811 the Countess of Regla wrote the Tribunal describing the losses suffered by the family's mines in Pachuca and Real del Monte at the hands of the rebels, and said that because of these and the ruin of many of the mines she was unable to pay the debt owing to the Tribunal.<sup>59</sup>

The general effects of the Revolution may best be summarized in the words of the Tribunal itself. Written in 1816 when the insurgent cause was at its lowest ebb and the chances of restoring order seemed bright, this dispatch, which sought a reduction in taxes, gives a vivid picture of the effects of the revolution on the mining industry. The Tribunal wrote:

It is a well known truth that these dominions passed suddenly from a state of the greatest prosperity to one of complete misery, because of the confusion and upheaval of all branches occasioned by the rebellion, whose spirit spread with the speed of lightning and whose flame has not been quenched at the end of six years, rather causing greater damage as time goes on.

With some infected by the contagion of rebellion, others forced to flee to save their lives, and others entering the armed forces, in an instant businesses, dwellings, and towns were abandoned by their owners and inhabitants. Communications and intercourse were severed, commerce paralyzed, agriculture neglected, the fields desolate, and the crafts and industry brought to a standstill and with

<sup>58</sup> Tribunal to Viceroy, Dec. 6, 1810, *A.G. Minería*, vol. 29, expediente 1, No. 87.

<sup>59</sup> Quoted by the Tribunal in a dispatch to the Viceroy of July 27, 1811, *A.G. Minería*, vol. 29, expediente 1, No. 48.

no outlet for their products. With a complete cessation of activity there was a consequent drop in the income of the Royal Treasury at the very time that its expenses were increased enormously by the necessity of putting in active service all the militia and reinforcing the military force with innumerable troops, some of the line and others of armed peasantry, at heavy expense to the Treasury, even though many of them serve at their own expense.

Everything would probably have recovered as soon as the first explosion and bewilderment caused by the rebels had passed if the mining industry had been able to resume the condition in which it had formerly been. This industry being the only productive one in these dominions is also the one which gives life and movement to all the rest. But it is of such a nature that it demands constant attendance, and when this ceases it is not like others that after the passage of time are found in the condition in which they were left. Rather it deteriorates, because the timbers decay, the ceilings and walls cave in, the excavations crumble and fill up, water occupies and floods the mines; tools, machinery and even the buildings of the smelters are ruined. The repair of all this damage demands the expenditure of huge sums before a single piece of ore can be extracted and refined; and then the miners begin to experience the results of an occupation so uncertain that most of those who practice it barely make expenses, although whatever be their fate it renders benefits to the Royal Treasury, the State and the Public.

If this is the result of the suspension of only one mine or mill, one can readily understand what the state of the mining industry must be after the suspension of activity in all parts at one time for two years, for longer in many regions, and up to the present in others. It is true that since the end of 1812 the owners have tried to re-establish the industry, but, since on returning to their homes they find them sacked, their mines worked by the insurgents only with the object of extracting what they could without conserving them, and their smelters burned or destroyed in a thousand other ways, their greatest efforts can do little more than evidence their love for the task and indicate the means of reëstablishing the industry if it had the assistance which they cannot give it; because to all the above misfortunes is added the scarcity and cost of the articles which they consume. Those which they import from outside are scarce in proportion to the almost total lack of communications, and the risks and costs of transport which have increased the freights; and those which are produced at home, such as grain, meat, hides, and other articles

of this nature, likewise are lacking because of the destruction of the livestock. In addition they bear all the general taxes like other subjects, special ones as miners, and the imposts which have been established in each locality with no rule except the need of those who have levied it. Finally, since the commerce in quicksilver has been made free, the mining industry has received the ultimate blow necessary for its ruin, since this measure alone diminishes by at least five or six reals the value of each marc of silver, whose price they (the miners) have no means of raising.<sup>60</sup>

This description shows why it was virtually impossible even to consider measures for restoring the mining industry until after 1815 when a semblance of order had been restored in a good part of the country. In the meantime, however, a number of specific problems had arisen in which the Tribunal tried to be of service.

The problem of a supply of quicksilver, always a serious one, became acute due to the occupation of the Spanish mines by the French and the difficulties of distribution in New Spain after 1810. Fortunately in 1809 the Junta in Spain ordered the shipment to Mexico of over fifty thousand quintals of this commodity, news of which was received with the greatest gratitude by the Tribunal and the provincial deputations.<sup>61</sup> After this the situation became more serious, both in Spain and in Mexico, and with the drying up of the Spanish sources it was necessary to encourage other possible supplies. Therefore, on January 26, 1811, the Regency ruling Spain issued an order allowing the exploitation of the quicksilver deposits of New Spain on much more liberal terms than those prevailing previously. It will be remembered that in 1779 permission had been granted for the denouncing and working of quicksilver mines by individuals, but under the conditions that the crown should

<sup>60</sup> Tribunal to Secretary of State for the Treasury, Mexico, Oct. 14, 1816, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2250, expediente C2; the surprising objection to the establishment of free trade in quicksilver will be explained below.

<sup>61</sup> Tribunal to D. Francisco Saavedra, Mexico, July 28, 1809, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2248, expediente D2.

have the right to purchase the mine at any time and that the product could only be sold to the Royal Treasury for distribution via the regular monopoly. Although this order resulted in some exploration for quicksilver mines and in efforts at working a few of them, it never had very much effect on the supply.<sup>62</sup> The Regency felt that the reason the earlier order had never produced better results was because of the fear of anyone developing a mine that he would have to turn it over to the government as soon as it became profitable and because of the requirement that all produce be sold to the Treasury. Hence it recommended to the Cortes, and the latter approved, a new ordinance, whereby quicksilver mines could be worked freely on the same terms as those of gold and silver, with the denouncer guaranteed possession for as long as he worked the mine and the right to sell his produce to whomsoever would give him the best price. In view of this the Viceroy was ordered to do all in their power to encourage the discovery and exploitation of quicksilver deposits.<sup>63</sup> At the same time the Regency wrote the Tribunal informing it of this decree and urging it to use all its influence to stimulate the search for and development of quicksilver deposits, promising honors to those who should do so or invest funds in such projects. Furthermore it suggested that the Tribunal pick out a good prospect and develop and operate it itself as an example to the whole Mining Guild, and that it encourage a number of the provincial deputations to do likewise where deposits occurred within their districts.<sup>64</sup>

Although this decree is important as representing a significant change in policy and the abandonment of the ancient quicksilver monopoly, at least for the deposits of the New World, it is doubtful whether it had much practical effect. Conditions

<sup>62</sup> Cf. above, p. 254.

<sup>63</sup> Regency to Viceroy of Mexico and Peru and President of Chile, Isla de León, Jan. 26, 1811, *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2249, expediente A5.

<sup>64</sup> Regency to Tribunal, Isla de León, Jan. 26, 1811, *A.I.*, *loc. cit.*

were too troubled in New Spain during the next few years to permit much development of new deposits. Rather attention continued to be centered on the supply from Europe and its distribution within Mexico. The latter particularly raised serious difficulties, as not only did the interruption of communications render it impossible to supply some districts, but with the disorganization of the administration the allotment tended to be haphazard. Thus in 1814 the Tribunal objected to an order from the Regency given at the instance of a deputy of Zacatecas in the Cortes. This instructed the Governor of Veracruz to send to the Intendant of Zacatecas for distribution to the Reals of Guanajuato and Nueva Vizcaya a shipment of two thousand quintals sent to Veracruz. The Tribunal objected that this region was already well supplied with quicksilver from former shipments, including one from the British Government. Furthermore Zacatecas had not yet paid for a shipment of the preceding year. It implied that Zacatecas was getting more than its share of quicksilver through the influence of its deputy in Spain, and requested that the Governor of Veracruz be instructed not to execute any further royal orders concerning the distribution of quicksilver until after consulting the Viceroy and the Tribunal as to the needs and existing supplies of each district.<sup>65</sup> At almost the same time the Spanish Government was drawing up an important order concerning the mining industry as a result of suggestions made by this same deputy of Zacatecas, Don José Miguel Godea. Included in this order was one paragraph which referred to the distribution of quicksilver. This provided that henceforth this function should be under the general direction of the *Tribunal de Minería*. While the Tribunal should decide on the primary, or wholesale, distribution of quicksilver, its allotment to individuals should be in the hands of the provincial deputations, and the Tribunal was to draw up regulations to govern this distribution

<sup>65</sup> Tribunal to Secretario . . . de Ultramar, Mexico, Aug. 1, 1814, *A.I.*, Sec. 5, *Aud. de Méx.*, Leg. 2239, expediente 22.

and assure payment to the Treasury.<sup>66</sup> This may have improved matters somewhat, as on July 25, 1815 a committee of the *Junta General de Minería* reported that "it was satisfied with the measures taken by the Tribunal for the distribution of the quicksilver existing in the capital and in Veracruz . . ." <sup>67</sup> It appears, however, that there continued to be much irregularity; a dispatch of the Viceroy of the same year referred to the fact that a shipment of quicksilver in Veracruz had disappeared from the storehouse and got into the hands of merchants and speculators "with grave damage to the mining industry and all the kingdom." <sup>68</sup>

The final developments in the quicksilver situation before independence are described in a representation of the Tribunal written at the end of 1818, and directed to the Minister of the Indies by the Tribunal's attorney in Madrid on November 14, 1819.<sup>69</sup> This recited the importance of quicksilver to the mining industry at all times and the concern of the Crown that there should be a constant supply, "not only cultivating carefully the mines of Almadén, but seeing to it that the quicksilver which these produce, far from being subject to monopoly and commercial ambition, should be shipped on account of the Royal Treasury to be distributed among the poor miners of New Spain, giving it to them on six months' credit and at a fair price . . ." The events in Spain involving the occupation of Almadén by the French were then mentioned, followed by the insurrection in New Spain and the futile efforts of the Tribunal to distribute quicksilver. Then came a change of circum-

<sup>66</sup> Lardizabal (Minister of the Indies) to Viceroy, Madrid, Aug. 8, 1814, *A.G. Cédulas*, vol. 211, No. 54, the other points in this order will be discussed below.

<sup>67</sup> *Informe a las Juntas Generales de los comisionados de ella 24 de julio de 1815*, Paragraph 13 (contained in *Testimonio del Quaderno 2º del expediente de las Juntas Generales celebrados por las Minerías del Reyno de N. E. en el año de 1815*) *A.I., Sec. 5, Aud. de Méx., Leg. 2237*, expediente 12; cited hereafter as *Informe . . . de los Comisionados (1815)*.

<sup>68</sup> Viceroy to Minister of Indies, Mexico, Aug. 31, 1815, *A.G. Virreyes*, Ser. II, vol. 9/262, No. 52.

<sup>69</sup> This is one of five representations of the same date; the others will be mentioned below; all are in *A.I., Sec. 5, Aud. de Méx., Leg. 2237*, expediente 35.

stances from which the miners hoped for a great improvement, trusting in the beneficence of the King to assure a plentiful supply of quicksilver on credit and at a fair price. But unfortunately the condition of the Treasury was such that it could not bear the expense itself. Therefore, wishing that the miners of New Spain might not be deprived of quicksilver, the King on December 30, 1815 had ordered the sale of existing supplies of quicksilver in Spain to merchants for transport to America, ending the royal monopoly and permitting free trade in this article until further orders. Although meant for the benefit of the miners, this measure had immediately brought new obstacles to the progress of the industry "which, deprived of the advantage which the distribution of this substance by the Royal Treasury offered them, and compelled to buy it from speculators and private merchants who set the price according to their own will, . . . found itself obliged to suspend its operations and abandon rich mines because of the lack of quicksilver . . ." Under these circumstances the Tribunal had decided that the only course was for it to impose an extra tax on the mining industry and itself purchase quicksilver in Seville and Cadiz. It had proposed this to the Viceregal government, "but in many months there had been no progress because of its indolence." Hence, as the only way to save the situation, the Tribunal begged that the mines of New Spain be exempted from the quinto for the time being in order that the funds thus saved might be used for the purchase of quicksilver.

This representation is of interest partly for the light it throws on the situation in the final years, but more because of the rather surprising testimony that under some circumstances, at least, a royal monopoly was to be preferred to free trade. Various writers have criticized the quicksilver monopoly as detrimental to the mining industry,<sup>70</sup> and there can be no question that on the whole this was probably so and that there were grave abuses in its administration. Here, however, we

<sup>70</sup> For example, Fisher, *Background of . . . Mexican Independence*, p. 140.



find the Mining Tribunal emphasizing the misfortunes which the substitution of free trade for the former system had brought to the mining industry. It may be said that in presenting this view the Tribunal represented the powerful miners who were not able to control the supply in their own interests as well as when it was a monopoly. This hardly seems probable as it was these same rich miners who could have afforded to pay cash for their quicksilver and buy it directly in Veracruz, Mexico, or even Spain. Rather it seems probable that the troubled conditions of the time prevented true free trade based on an adequate supply and free competition, and substituted a number of petty private monopolies for one universal government monopoly.

The reverse of the problem of furnishing quicksilver and other supplies to such mines as were in a condition to operate was the exchange of the silver bullion for cash. In normal times most of the silver produced was brought to the mint in Mexico either by the miners themselves or their agents or by *rescatadores*, or brokers, who bought the bullion from the miners or refiners and subsequently took it to the mint under strict regulations designed to prevent the avoidance of taxes.<sup>71</sup> The insurrection, by making communication with the capital difficult and in some cases impossible, meant that bullion would accumulate in the provincial mining centers without there being any way of converting it into currency. Most miners operated on too slim a capital to be able to continue very long without such conversion of their product; the brokers, unable themselves to get currency, would only buy bullion at a heavy discount which in many cases meant ruin to the miners. Hence the Tribunal sought some means of facilitating the exchange of bullion for coin. Two measures were taken: the establishment of *Bancos de Rescate* or metal exchanges, and of provisional mints in a number of the more important mining centers.

The Bancos de Rescate were not altogether new. In 1803

<sup>71</sup> Cf. the *Ordenanzas de Minería*, Tits. 14 and 15.

the King had given permission for one to be erected in Guajuato as an official government exchange under the Treasury. In that case it was to receive an initial capital of \$400,000 and buy bar silver in quantities of not less than ten marcs. The capital would in effect be a revolving fund, being replenished by the cash which the Exchange itself would receive for the silver which it entered at the mint. The object was the greater convenience of the miners by giving them an official outlet for their product under the direct supervision of the local sub-treasury.<sup>72</sup> In 1812, as a result of representations by the Tribunal and Viceroy, the Regency granted permission for the extension of this system generally to any mining centers where the establishment of these exchanges should seem desirable. The Viceroy was cautioned, however, to see that the right of the Tribunal to collect its seigniorage fee, usually taken when the bullion entered the mint, be strictly protected. It had been proposed that the treasury officials collect this at the time the silver was discounted in the new exchanges, but the Regency ordered that the Tribunal continue to be permitted to collect it at the mint, or, if it preferred, to have it exacted by the provincial deputies at the provincial subtreasuries, but that at all events its collection should remain in the hands of the Tribunal, unless the latter should itself wish to make some other arrangement.<sup>73</sup>

The establishment of these provincial silver exchanges undoubtedly helped the situation, but the difficulty of transporting the bullion to the mint in Mexico still remained. Also, as money became scarce in the provinces, it became necessary to take some measures to counteract the illegal coinage of silver by the rebels and the circulation of these debased coins even in territory controlled by the government. It seems that a mint had been established in Guadalajara in 1810, but had not been

<sup>72</sup> Soler to Viceroy, Aranjuez, Apr. 30, 1803, *A.G. Cédulas*, vol. 187, No. 122.

<sup>73</sup> Romanillos (for the Regency) to Venegas, Cadiz, Feb. 6, 1812, *A.G. Cédulas*, vol. 206, No. 132.

of much service because of the practical cessation of mining during the next two years.<sup>74</sup> Sometime prior to 1814 a mint was erected provisionally in Zacatecas; just when we do not know, but the dispatch of Lardizabal of August 8, 1814 instructed the Viceroy to have the Tribunal report on the usefulness of this establishment and whether or not it should be continued or be moved to some other city where it could be of more service to the distant provinces.<sup>75</sup> During the following year the government considered the establishment of additional provisional mints,<sup>76</sup> and this project received the hearty endorsement of the miners. The committee of the Junta General reported on July 24, 1815 as follows:

While the present circumstances and difficulties of communication continue in the Kingdom, the Committee is of the opinion that it is to the interest of the mining industry for the Tribunal to bring about the establishment of the four provisional mints, which the Superior Government is known to be considering, in the places which it judges most convenient; since the experience of the time which has passed since the Government held the opposite opinion has shown that since it has not been able to open up the roads and assure adequate communications, the *Reales de Minas* have lacked the necessary currency, with a resulting debasement in the value of silver bullion and consequent prejudice to the miners. For this reason, since the lesser evil should be chosen, it lies without doubt in the said establishment (of the provisional mints), and this may be of positive good in the present circumstances, provided that the government takes the necessary measures to see that the coinage is perfect, as is the case in Guadalajara.<sup>77</sup>

Again, information is lacking as to just where additional official mints were established, but from subsequent evidence it is clear that they were erected in Durango and Guanajuato

<sup>74</sup> Cf. Fisher, *Background of . . . Mexican Independence*, pp. 188 and 214; the dates and facts given here appear to be somewhat confused, as will appear below.

<sup>75</sup> This is the same dispatch referred to in footnote 66.

<sup>76</sup> Cf. Fisher, as above.

<sup>77</sup> This is paragraph 27 of the report of the Committee described in footnote 67.

in addition to Guadalajara and Zacatecas. In 1817 Elhuyar wrote an opinion on the usefulness of these provisional mints and the advisability of continuing them.<sup>78</sup> He mentioned the necessity of a ready outlet for the silver produced at all times and a consumption in proportion to the production. In the case of New Spain the local demand could not take care of the supply and the export of silver was highly desirable. This could best be done in the form of money, and hence it was desirable to have the mints on the natural road between the mines and the ports. Under normal circumstances, the mint in Mexico could probably take care of all needs, although if other ports besides Veracruz were opened to commerce it might be desirable to establish one or two additional mints convenient to them. He said that the need for the provisional mints in the provinces did not arise from the shortage of money for circulation but from the necessity of providing for the prompt coinage of the silver mined — both in order to permit the miners to continue operations and to enable the government to preserve order. He went so far as to give these mints a considerable share of the credit for preserving — or regaining — the loyalty of their provinces, while admitting that they had been inefficiently run mechanically with resulting high costs. While he felt that conditions had improved greatly he said that they were far from normal. Communications were still difficult, credit disorganized, and the exchange of silver in the subtreasuries only possible at a discount. Under these circumstances Elhuyar believed that the discontinuance of the provisional mints would be disastrous for what was left of the mining industry and might have serious effects on the tranquillity of

<sup>78</sup> Mexico, May 3, 1817, *A.J.*, Sec. 5, *Aud. de Méx.*, Leg. 2237, expediente 29; Orozco y Berra records that money was coined in the following provincial capitals during the revolutionary period: Chihuahua, 1811-1814; Durango, 1811-1821 (continued later); Guadalajara, 1812-1818; Guanajuato, 1812-13; Sombraete, 1810-1812; Zacatecas, 1810-1821. He does not indicate how much of this coinage was official and how much was carried on by the insurgents; cf. Appendix A.

those provinces. While preserving them, he said that their operations should be greatly improved, especially from a technical point of view.

Apparently these provisional mints and government Bancos de Rescate helped considerably in the districts where they were established. There were many districts which were not thus served, and suffered accordingly. Tasco was one of these, and in 1814 a merchant of Mexico named Don Luis Escobar sought permission to open a private silver discount bank in Tasco. He proposed to pay seven pesos for each marc of silver brought in, deducting one real for the support of the local garrison, and to pay half of the regular royal taxes at the time of entering the silver at the Treasury, the other half being credited against a substantial balance owed him by the government. After consulting the Tribunal and Treasury officials, the Viceroy Calleja granted the necessary permission and the bank was opened. It proved to be of great benefit not only to Tasco but the surrounding Reals of Zacualpán, Sultepec, Angangueo, and Tepantitlán as they were recovered from the rebels. Escobar applied for renewal of permission in 1818, with the backing of the local mining deputation, the Tribunal, and many government officials, who felt that not only Tasco but the royal treasury had benefited, even though the latter only received directly half of the taxes due on the silver brought in. Under these circumstances both the Viceroy and the government in Spain approved renewal of the permission, but "with the express condition that it should cease as soon as the royal treasury was able to engage in the discount of silver on its own account . . ." <sup>79</sup> This is a rather rare and refreshing example of the initiative of an individual and of its recognition by the government, the latter evidently due to the extraordinary conditions.

Whether because of this successful example or not, in 1818

<sup>79</sup> Apodaca to Minister of Hacienda, Mexico, Aug. 31, 1818; *A.G. Virreyes*, Ser. II, vol. 7: 275/278, No. 493; Report of José de Tejada, Contador General de la America Septentrional to the Minister of Hacienda, Madrid, Mar. 30, 1819, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2249.

Apodaca undertook to spread this system of private silver discount banks. After consultation with the audiencia, he suggested to the consulado of Mexico that it undertake the opening of subscriptions to a private company which should have a capital of \$1,500,000 and establish these banks in all reals of importance not already provided with exchange facilities by the government. The consulado did not take to the idea with much enthusiasm but agreed to carry it out, and on its suggestion and that of the Tribunal the Viceroy published an edict giving the conditions for the formation of the company as follows:

(1) That inasmuch as the funds of the company would be substituted for those ordinarily used by the Treasury, the benefits of these funds should be extended to all the subtreasuries of the Kingdom, except where there was already provision either by the Treasury or individuals.

(2) For the present the company should have a capital of \$1,500,000.

(3) The Company should enjoy a discount of two *reals* in each marc of silver taken in as well as the other charges usually made by the subtreasuries on the exchange of silver, it being estimated that if the capital was turned over four times a year it would enjoy an annual yield of fourteen percent.

(4) That the exchange should include silver mixed with gold, whose value should be converted to terms of silver.

(5) The miners should remain free to sell their silver to whomever they wished or send it to be exchanged at the mints.

(6) The stockholders should not be free to withdraw their capital for three years, unless the Treasury was able to establish banks on its own account sooner.

The Viceroy described this project in a dispatch of late 1818 and asked for the approval of the King. On February 5, 1819, the contador-general recommended prompt approval and spoke of the scheme as highly praiseworthy and greatly to the credit of the Viceroy's initiative.<sup>80</sup>

<sup>80</sup> The Viceroy's edict and his dispatch to the crown are included in the report of the Contador, Tejada to the Minister of the Hacienda, Madrid, Feb. 5, 1819, *A.I., Sec. 5, Aud. de Méx., Leg. 2249*.

Whether this company established any exchanges or did any business before independence we do not know. The interesting thing is that in this time of emergency the government turned to private enterprise to carry out functions which it ordinarily carried out itself. One wonders whether if this policy had been adopted earlier a more self-reliant spirit might not have been developed and the subsequent history might not have been brighter.

It is evident from what has been said thus far that there was little the Tribunal or the government could do to help the mining industry during the first years of the Revolution when many of the mining centers were occupied by the insurgents and conditions everywhere were chaotic. By 1813 conditions had begun to improve somewhat, but were still far from normal. In June of that year the Tribunal wrote:

Because of the lack of communications due to the obstruction of roads caused by the insurrection, this Tribunal lacks the necessary reports to give an account of the state of its funds to the *Junta General del Cuerpo*, which for the same reasons has not been able to convene in the year and a half which has elapsed since the time when, according to the Ordinances, it should have been held. It is nearly three years since the upheaval began in these provinces, and for all this time the Tribunal has been ignorant of the actual decrease in its income and of the sums which it has lost in the different invasions of the insurgents.<sup>81</sup>

A year later the situation was still very difficult. On December 27, 1813, the government in Spain sent the Tribunal instructions to gather information on actual conditions in the various *reals* of the country and enclosed forms for the replies. The Tribunal acknowledged the order, expressing its gratitude for the interest of the government and promising to do the best it could; but it anticipated difficulty in getting the information, "as long as the occupation of some *Reales de Minas* by the

<sup>81</sup> Tribunal to Secretario de Ultramar, Mexico, June 9, 1813, *A.J.*, Sec. 5, *Aud. de Méx.*, Leg. 2249, expediente C1.

rebels and the obstruction of communications with the others . . . continued . . .”<sup>82</sup>

Notwithstanding these drawbacks, in 1814 some consideration began to be given to measures to rehabilitate the mining industry and to rescue the Tribunal from the financial straits in which it found itself. The Junta General finally met on December 27, 1813, and remained in session off and on for nearly two years.<sup>83</sup> We have already studied the accounts which the Tribunal presented to the junta and observed the fact that the latter considered as very doubtful a number of the accounts receivable with which the Tribunal credited itself. After these statements had been considered for some time, the delegates from Sombrerete and Fresnillo expressed the opinion that the only solution of the financial difficulties was the suspension or radical reform of the Tribunal and the School and the devotion of all income to the payment of interest and retirement of debt. Some of the other delegates agreed with them while others disagreed; naturally the Tribunal opposed the suggestion vigorously. The debate on this subject continued in a desultory sort of way throughout the year 1814. Early in 1815 a majority of the junta voted down the proposal to discontinue the Tribunal and College and on April 8th proceeded to the election of the new ministers.<sup>84</sup> The proposal to suspend the Tribunal was not dead, but, as we shall see, was revived in the summer of 1815.

In the meantime the Tribunal and Junta General received the royal order of August 8, 1814.<sup>85</sup> In addition to the clauses dealing with quicksilver and mints already considered, this dispatch contained the following provisions:

<sup>82</sup> Same to same, Mexico, Aug. 1, 1814, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2239, expediente 20.

<sup>83</sup> *Testimonio integro del expediente formado con las Actas de las Juntas Generales de su cuerpo principiadas en 27 de Diciembre de 1813, y concluidas, en quanto a las elecciones, el 8 de abril del presente ano (1815), A.I., Sec. 5, Aud. de Méx.*, Leg. 2237, expediente No. 8, hereafter cited as “Actas, 1813-1815.”

<sup>84</sup> “Actas, 1813-1815,” *loc. cit.*

<sup>85</sup> *A.G. Cédulas*, vol. 211, No. 54, cf. above, p. 400.



(1) It broadened the list of articles necessary for mining that were to be exempted from the *alcabala* and ordered the circulation of both the new and old lists to all reals.

(3) After consultation with persons experienced in contentious jurisdiction, the Tribunal was to render its opinion as to whether it would be wise to modify that part of Tit. 3, Art. 5 of the Ordinances which prohibited the filing of briefs signed by lawyers, so as to permit litigants to hire lawyers of their choice to handle their cases.

(4) Likewise, after a careful consultation, the Tribunal was to give its opinion as to whether the abuses alleged to arise from that section of the royal order of February 5, 1793, which provided that *Jueces reales* should sit with the Deputies in first instance in fact existed, and if so what method it would recommend substituting for that in effect.

(5) Likewise, the Tribunal was to give its opinion as to whether it would be useful to move the *Juzgado de Alzadas* of Guadalajara to some other place, or whether it would be better to establish additional ones in Zacatecas and Durango so that the miners of the Provincias Internas could have courts of appeal near home.

(7) Finally the Tribunal should suggest any and all measures it deemed necessary for the restoration of the mining industry, without prejudice to the interests of the Royal Treasury.

This order coming soon after the restoration of Ferdinand VII is interesting for its liberality. Apparently the bitter complaints against the jurisdictional parts of the order of February 5, 1793, which we studied in Chapter VI, were now having their effect. It also seems fair to assume that, although we have not much data on the situation after 1800, the complaints had continued and that there was general dissatisfaction with the existing system of primary jurisdiction.

Among numerous other matters dealt with, the committee of the Junta General gave its opinion on the points raised in this royal order in its report to the junta general of July 24, 1815. We have already mentioned its views on the quicksilver and coinage situations, that is, points 2 and 6 of the order. Concerning point 1, the committee reported difficulties in making effective the exemption from the *alcabala* and urged the Tribunal to make further representations to the crown to assure observation

of the decree.<sup>86</sup> The comments on points 3, 4, and 5, concerning jurisdiction, are of particular interest, due to our discussion of earlier views on this subject. On the third point, it strongly recommended the elimination of the prohibition against the filing of written briefs signed by lawyers.<sup>87</sup> The committee said such briefs were filed regularly, but, being unsigned, the authors had no responsibility for them and went outside all bounds of decency and legal ethics in writing their briefs. They saw no reason why miners should not avail themselves of lawyers and felt that the latter should be held responsible for what they wrote. They recommended, however, that lawyers should not be allowed to make oral arguments before mining courts.

On the fourth point the committee said that the evils complained of in having the royal judges sit with the Deputies did not come from the fault of the system, but from the individual characteristics of the subdelegates. The weakness came from "the system of administration of justice in this kingdom in first instance being entrusted to subjects in no way qualified for such a delicate duty, and without a salary or other honest means of subsistence. . . ." <sup>88</sup> It then said that in most districts the legal court fees were negligible, that most subdelegates had existed on the percentage of the Indian tribute allowed them, and that since the recent abolition of the tribute even this income was denied them. Under these circumstances the arguments formerly made against the system were even more urgent now and unanswerable. But, the committee said, if the system were changed so that the subdelegates received a regular salary, as it understood was provided in the new Ordinance for Intendants, then the committee felt that far from being harmful the attendance of royal judges in first instance in mining cases would be of benefit. It believed "the judicial experience, disinterestedness, and impartiality which such judges should be presumed to have, although unfortunately it was not always the case at present,

<sup>86</sup> *Informe . . . de los Comisionados* (1815), *loc. cit.*, paragraph 19.

<sup>87</sup> *Ibid.*, paragraph 37.

<sup>88</sup> *Ibid.*, paragraph 6.

would be a useful counter-balance to the mining deputies, united as they were by necessity to the other miners (of the district) by business and personal connections. . .”<sup>89</sup> This realistic opinion in a way confirmed both parties to the dispute of the year following 1793. The miners apparently were justified in their complaints against the working of the system; while, as was so often the case, the theory of the crown was wise and failed only because it neglected to take into account the personal and human factors involved.

On the fifth point, the committee said that the suppression of the court of appeals of Guadalajara appeared necessary to it for the same reasons presented by the Tribunal and miners in years gone by. It left to the Tribunal the decision as to whether to recommend that all appeals come to it or that a new court of appeals be established in some place convenient to the more remote mining districts.<sup>90</sup>

As to the seventh point, the making of general recommendations, the committee said that the Tribunal had already made some while others were included in the other sections of its report.<sup>91</sup>

None of the recommendations concerning the handling of contentious jurisdiction was put into effect before independence came, although on the very eve thereof the government in its usual dilatory fashion was setting in motion machinery to amend the *Ordenanzas de Minería*.

The other sections of the committee's report covered a variety of recommendations to the Junta General and, through it, to the Tribunal. Some of these are of no importance while others are of some interest.

Section 8 recommended that the term of four years' training required for admission to examinations for the post of assayer in the mint and subtreasuries be reduced to one year in the case of graduates of the School of Mines. This suggestion had been

<sup>89</sup> *Ibid.*

<sup>91</sup> *Ibid.*

<sup>90</sup> *Ibid.*, paragraph 37.

made by Don Manuel Ruiz de Tejada, who it will be remembered was an alumnus of the School and was at that time serving as professor of physics, and who himself aspired to a position in the mint. The committee felt that in the case of such graduates one year's specialized training was enough, and that the change would open up opportunities for the graduates. In this connection the committee also observed, in sections 8 and 10, that the expenses of the School must be kept as low as possible for the time being, recommending refusal of an increase in salaries asked by the faculty and suspension of improvements to the School building. In sections 20 and 22 the committee approved the efforts being made by the Tribunal to have taxes on miners reduced.<sup>92</sup>

In section 25 and section 26 it recommended that the Tribunal's impost on silver continue to be collected at the mint rather than in the provincial subtreasuries; except that the tax on silver shipped abroad as bullion should be collected by the Tribunal's representative in Veracruz, who should be allowed a fee of 10 per cent for his services. Sections 31 to 35 dealt with the money owed by and to the Tribunal. The committee noted the demands of the creditors for payment of interest and the fact that some of them had been paid part of that owed them, in some cases at the instance of the government. It recommended that in the future whenever there were funds available for payment of interest they should be strictly prorated among all the creditors, so that there would be no opportunity for favoritism or undue influence being brought to bear. Section 32 demanded that the Tribunal proceed actively to collect the sums due from the Marqués de Rayas and the executor of D. Ignacio Obregón. (One wonders if the Conde de Regla's debt had been paid.) Likewise in section 33 the committee demanded that the Tribunal proceed against those responsible for the shortage in its funds in the year 1808. From section 34 it appears that part of the shortage charged to the factor in the account of 1813 was

<sup>92</sup> Cf. below, pp. 421-423.

due to capital advanced to a mine in Tasco and another in Real del Chico — whether on his own account or by order of the Tribunal is not clear. At any rate the committee urged that a careful eye be kept on these two enterprises, and that the factor be compelled to repay his shortage as best he could out of his current business.

This concludes the more important recommendations of this committee. Unfortunately anonymous, this document strikes one as one of the ablest and most conscientious reports in the whole history of the Tribunal. It is realistic, objective, and blessedly free of *ex parte* pleading and meaningless rhetoric. Written at a most difficult time, it accepted the situation as it was and made constructive suggestions instead of heated accusations or transparent excuses. It makes one wonder if the history of the Tribunal and Mining Guild might not have been brighter if the Junta General had been permitted to play a more important role throughout its existence.

The next document before us presents a great contrast to this. This was a report of the Tribunal to the Junta General, dated April 22, 1815, which in effect constituted the Tribunal's "*apologia pro vita sua*." <sup>93</sup> It was presumably occasioned by the suggestions for the suspension of the Tribunal and the debate incident thereto, as well as by the junta's criticism of its financial affairs. Although it is so lacking in objectivity and gives in many ways such a false picture as to lose much of its value, it is worth studying as the Tribunal's own statement of the value of its forty years' existence. The report may be summarized as follows:

Prior to the formal organization of the *Cuerpo de Minería* the mining industry was regarded with disfavor and suspicion; the miners themselves were able to do little to lighten their burden or improve their reputation. Since that time this had all changed so that mining had become now an honorable profession and

<sup>93</sup> A "testimonio" of this report, dated Mexico, July 3, 1815, is in *A.I., Sec. 5, Aud. de Méx., Leg. 2237, expediente 9.*

the Mining Guild as a whole was regarded as one of the respectable organs of the State. Furthermore the industry had had in the Tribunal a guardian zealous in watching over its interests, vigilant to protect it from harmful measures and to promote the passage of useful ones. All of this development was responsible for the flourishing state of the industry prior to the insurrection. The tremendous increase in production of gold and silver was credited in large part to the organization of the Guild, since the latter had unified the industry and given it new life. The creation of the provincial deputations was then hailed as a great step and their service to the industry praised as if they had actually carried out in practice the duties entrusted to them in the Ordinances. These, however, would have been of little use without the Tribunal — the head and heart and guiding force of the whole body, devoted to promoting the interests and welfare of the mining camps. By its character, composition, and the confidence in which it was held, the Tribunal had been able to give intelligent direction to the activities of all the miners and exercise its influence in their behalf, both collectively and individually. It was responsible for the privileges accorded the industry, and no private agents could have represented the industry as a whole or the miners individually as had the Tribunal, which had prosecuted all matters resolutely, without discord, and in an orderly manner. Turning to financial aspects, it was claimed that in reality all the benefits derived from this system had cost the miners nothing. While having to pay eight grains in the marc of silver to the Mining Fund, they had been relieved of the double seigniorage which had amounted to twelve grains. It was admitted that at various times there was an extra impost of one, two, or four grains to pay the costs of the loans and gifts to the crown, but even taking this into account, there had been a saving to the miners of the country of \$1,355,704-5-02 since the erection of the Tribunal.<sup>94</sup> It was

<sup>94</sup> This figure seems reasonably accurate as it is based on the amount actually collected by the Tribunal since its creation.

alleged that the double seigniorage would never have been terminated if it had not been for the erection of the Tribunal; hence the latter, and the whole system, far from costing the miners anything, had really paid them cash dividends, and would do so to an even greater extent when the various debts were paid off. In addition to this saving, the various privileges conceded to the mining industry, such as exemption from the alcabala, no increase in the price of quicksilver (in 1783 and 1787), lowering of the price of powder in 1801, and a temporary lowering of taxes in 1801-1803, were estimated to have benefited the industry to the amount of at least \$10,585,000.<sup>95</sup> All of these privileges were credited to the efforts of the Tribunal; furthermore the benefits were continuing and the total saving was increasing all the time. On the strength of this record, the Tribunal felt that it had more than justified its existence and that the delegates of the Junta General should be encouraged and realize the value of its services to the industry. The report was signed by Fagoaga, Elhuyar, Apezchea, Eguía, Septién, and Laso de la Vega.

The principal thing that impresses one about this report is its naïveté. It is written as if the Tribunal and Mining Guild had actually functioned in practice according to the theory of the Ordinances, as if the administration of justice had always been smooth and orderly, and as if at all times the Tribunal had faithfully represented the views of the *reales de minas*. All this we know was not the case. And yet the ministers signing the report, except for Elhuyar, were relative newcomers with no particular obligation to justify their predecessors. Elhuyar we

<sup>95</sup> This figure was arrived at as follows:

Saving in <i>alcabala</i> , 1781-1808 . . . . .	\$ 7,500,000
Saving from prevention of rise in price of	
Quicksilver (1783-1787) . . . . .	2,125,000
Saving from lowering of price of powder, 1801 . . . . .	360,000
Saving from lowered taxes, 1801-1803 . . . . .	600,000
	<hr/>
	\$10,585,000

know did not hold this favorable opinion; <sup>96</sup> his signature was probably due to the rule that all ministers should sign resolutions agreed on by the majority. The truth probably is that it was written to impress the Junta General with the value of the Tribunal and to offset the arguments for the latter's suspension; feeling that their jobs were at stake, the ministers thought themselves justified in painting the picture in the most favorable colors even if these were sometimes a number of shades brighter than the true ones. Notwithstanding its lack of objectivity the arguments of the Tribunal are worthy of some consideration, and we will return to them when we attempt to assess the true significance of its work.

Apparently this document did not have the hoped-for effect, for when the Junta General reassembled on August 15, 1815 the delegates of Pachuca, Fresnillo, and Guanajuato renewed the recommendation made the year before by those from Fresnillo and Sombrerete that money must be saved either by suspending the Tribunal and School or by drastically reducing their salaries and expenses. In the resolution which these delegates presented to the junta they said that the fiscal had informed the committee originally appointed to study the accounts that the income of the Tribunal could be estimated at \$163,000 annually or three-fifths of that received prior to the insurrection, basing this on an optimistic view of the situation in the more important *reales de minas*. At the time the committee had expressed the view that the fiscal's estimates were overoptimistic, and events since then had shown these fears justified. They said that the delegate of Guanajuato was certain that his district would not produce a fifth of its former total, that large amounts of silver were being smuggled out of the country, that the balances on which the Tribunal had counted in the subtreasuries had been seized by the military, and finally that the rebels were threatening San Luis Potosí and Tasco.

<sup>96</sup> Cf. his *Reflexiones* of 1813, discussed below.



For these reasons, in discharge of our duties, and with regard to the honour of the Cuerpo, the Tribunal, and of the individuals who compose it, we repeat again the measures of economy which we agreed should be taken, since up to the present it appears that we were unfortunately right in the fears which we expressed at that time as to the sensible decline in the income of the fund, . . . The picture which the mining industry presents today is very different from that which the Tribunal, the fiscal and the assessors hoped to present, and for the same reason is worthy of consideration anew by the Tribunal so that responsibilities difficult or impossible of performance may not be undertaken.<sup>97</sup>

They then asked that the other delegates signify their agreement or disagreement with this view, and that the Tribunal give it prompt and careful consideration and report back with its reasons if it still disagreed.

This resolution was read to the assembled delegates and approved by those from Sombrerete, Sierra de Piños, and Cosihuiachi. The delegates from San Luis Potosí, Oaxaca, Parral, and Asientos de Ybarra opposed it on the ground that the whole matter had been discussed the year before and sent to the King for decision, where it was still pending. The fiscal protested that the resolution presented was too pessimistic, not taking into account funds to the credit of the Tribunal in a number of the provincial subtreasuries, some of which had not reported on their funds for over a year. Finally the Tribunal agreed to take the matter under consideration again and inform the delegates of its opinion.<sup>98</sup>

On August 29th the Tribunal referred the matter to its fiscal, who reported back on October 5th. He agreed with the delegates who had opposed the resolution that the Tribunal had already given its opinion and that the matter was now up to the King. Notwithstanding this, he argued that the views of the delegates from Fresnillo, Pachuca, and Guanajuato were not

<sup>97</sup> *Testimonio de la Acta de la Junta General de Minería celebrada el 17 de Agosto de 1815, A.I., Sec. 5, Aud. de Méx., Leg. 2237, expediente 24.*

<sup>98</sup> *Ibid.*

well founded. He emphasized that under the Ordinances the maintenance of the Tribunal and the School took precedence over all other claims upon the Mining Fund, and if the time came when the funds were only sufficient to pay these expenses, they should continue even if the creditors had to forego payment temporarily. But he felt that this situation would not arise. If the insurrection should continue and ruin the mining industry, and if the King did not protect it and grant the favors requested to restore it, it would be necessary for the Tribunal and School to suspend their activities and there would be no funds for the creditors; but if the King looked with favor on the industry, and took the steps necessary to help it out of its difficulties, he was sure it would return to a more prosperous condition than before the revolution and there would be no need to worry about the funds of the Tribunal. As evidence that the production of silver was greater than that claimed by the delegates, he cited the increased purchases of quicksilver in the past year. He stood by his former estimate that the income of the Tribunal could be estimated at three-fifths of that it received before the revolution. Finally, he said that only the King could alter the existing arrangements, emphasized once more the services and importance of the Tribunal and the School, and said that they could not be expected to discharge their functions on any less salaries than those they currently received, especially as the cost of living had increased so appreciably in recent years.<sup>99</sup>

On October 23d the Tribunal approved the opinion of its fiscal and ordered it given to the delegates of the Junta.<sup>100</sup> Thus the latter's efforts at economy came to nought, although at its next meeting in 1818 it was more successful. In this disagreement between the Junta General and the Tribunal the former seems to have been more realistic. Perhaps because the delegates were more familiar with conditions in the provinces they were not so sanguine as the members of the Tribunal. Besides,

<sup>99</sup> *Ibid.*

<sup>100</sup> *Ibid.*

as was said before, the Tribunal was arguing for its own existence. Aside from this, there is some reason in their argument that in this crisis it would be unwise to suspend it or the School. If plans had to be made and presented to the government for reviving the industry, the Tribunal was still the best-qualified agency to handle the task.

The Tribunal had reported the earlier debates in the Junta General and the original proposals for its own suspension in a dispatch to the Ministry in Spain of June 30, 1815. Besides sending the minutes of these earlier sessions, it enclosed a representation describing the serious condition of the mining industry and recommending measures that would aid its recovery. The covering letter reported that the proposals of the delegates of Fresnillo and Sombrerete had not received general approval, and were strongly opposed by the members of the Tribunal. The latter believed, after consultation with lawyers, that the only measures which it had authority to take to relieve the financial situation were: (1) to make more diligent efforts to collect the sums owed the Tribunal; (2) to eliminate every unnecessary expense and all expenses foreign to the purposes of its creation; and (3) to consider and propose to the King all measures which it believed would help revive the mining industry, such as were made in the accompanying representation.<sup>101</sup> The first part of this representation was very similar to the report to the Junta General described above, being an exposition of the Tribunal's services to the mining industry and using the same arguments as those discussed. This section of the representation concluded with emphasis on the point that the Tribunal had not been a financial burden on the miners. It also claimed, while admitting that it was financially embarrassed at the time, that it was in a better position to recover than other semi-public bodies because of its assured income — provided

<sup>101</sup> The letter and representation of the Tribunal of June 30, 1815, and the *Testimonios de las Actas* of the sessions of the Junta General held up to that time are in *A.I., Sec. 5, Aud. de Méx.*, Leg. 2237, expedientes 6-8; for the suggestions it had made to the crown, cf. below, p. 421.

that the mining industry received the aid needed to restore it. Mention was then made of the past solicitude of the crown for the welfare of the mining industry and the privileges granted it, and the assurance was expressed that now that this favor was needed more than ever, it would not be lacking. With this, the Tribunal turned to its proposals for recovery.

The first three proposals were designed to benefit the Mining Fund directly. The first was a bit complicated. It was alleged that according to the law the mint was supposed to collect one real on each marc of silver coined as seigniorage plus the actual cost of the coinage. But at the time, of the sixty-eight reals which were coined out of each marc, the owner only received sixty-four reals and two maravedis, leaving the mint with three reals, thirty-two maravedis. Subtracting from this the real of seigniorage and a little over half a real for the cost of the coinage (although the cost was actually much less than that now), it was clear that the mint was left with two reals to which it was not entitled, and that it had been collecting this for many years. The Tribunal proposed that one of these extra reals in each marc be turned over to it until the capital and back interest that it owed had been paid, and that thereafter the miners be freed of this irregular impost. It said that with the income from this source the debt could be very rapidly discharged and the miners benefited, while it was sure the King would see the justice of the proposal.

The second proposal was similar to the first. This said that there was always a surplus in the mint and assay office after expenses, and that although this really belonged to the miners it was impossible to determine the rightful owners. Hence the Tribunal suggested that this surplus likewise be turned over to it for redemption of capital and interest. In this way it would really be being returned to the miners, as the sooner the debt was paid, the sooner the funds of the Tribunal would be free for the much-needed habilitation of mines.<sup>102</sup>

<sup>102</sup> The suggestions that the miners and the Mining Fund be relieved by

The third point urged that the Treasury take over the payment of the interest on the remainder of its debt to the Tribunal, as it was really the payment of this interest over many years that had brought the fund to its present condition.

The fourth proposal was that the royal tax on silver be cut from the existing tenth to a twentieth. It was said that this would result in a greatly increased production of silver as it would permit the working of many low-grade ores, at present unprofitable. To support this the benefits resulting from the earlier reduction to a tenth from a fifth were recalled.

The fifth request was that quicksilver be supplied to the miners at cost, that is at thirty pesos a quintal delivered in Mexico. The crown was urged to sacrifice the profits from quicksilver for the sake of those which would come from a greater production of silver, and again the benefits derived from preceding reductions were cited. The remaining requests can be summarized briefly; they were:

(6) That Guanajuato be required to pay the grain it was retaining out of each real and thereby help pay off the debt.<sup>103</sup>

(7) That the emergency taxes *de conboy* on silver bullion, and *de guerra* on mine supplies be discontinued.

means of reforms in the Mint and seigniorage seem to have been based on a discourse by Elhuyar, before the Tribunal and Junta General on August 10, 1814 (*Indagaciones sobre la Amonedacion en Nueva España . . . presentadas en 10 de Agosto de 1814 al Real Tribunal General de Minería de Mejico, por al Director Don Fausto de Elhuyar . . .* imp. Madrid (Calle de la Greda), 1818, con licencia (142 pp.). This is a very thorough study of the history of coinage in New Spain, with particular emphasis on the various charges and imposts made on bullion brought to the Mint. The general conclusions were first, that a number of these were illegal and should be repealed for the benefit of the miners, and second, that the whole system of deducting these charges from the price paid the miners for their metal was wrong. Elhuyar argued that coinage was a public function of benefit to all and that the public (the crown) and not the miners should bear the expense. The latter should be paid the full value of their silver (68 reals per marc instead of 64 reals, 2 maravedis) and the expenses absorbed by the Treasury—which would benefit from the other taxes on the increased production. For the present he recommended that the difference go to the Tribunal to extinguish its debt, and also that the impost of two-thirds of a real on the marc be collected on gold as well as silver, which never had been done.

<sup>103</sup> This, it will be remembered, was because of Guanajuato's own gift to the crown; cf. above, pp. 375-376.

(8) That the exemption of mine supplies from the alcabala be made general and effective.

(9) That payment be made of principal and interest on the money loaned for the bridge of Zimapán and the Canal of Huehuetoca.

If these recommendations were carried out, the Tribunal said that there was no doubt that it could pay its debts and that prosperity would return to the industry. Finally the importance of the Tribunal in any plan of rehabilitation of the mining industry was stressed again and the suggestion that it be suspended dismissed as impractical.

While much of this representation is devoted to that same special pleading and emphasis on its own value that characterized the report to the Junta General, the positive suggestions of the Tribunal seem on the whole sound and constructive. That is not to say that they were altogether practical as most of them involved a sacrifice of present revenue by the crown, for the sake of future increase; it seems a little unrealistic to have expected such a sacrifice at a time when the Treasury was already strained almost to the breaking point.

After the meeting of the junta of August 17th, and its own subsequent action, the Tribunal sent another dispatch to the crown in January 1816. This enclosed the report of the session, as described above, and the opinion of the fiscal. The Tribunal contented itself with saying that it agreed with the fiscal's opinion and still held the same views as before. It did call attention to a recent report from the mint on the coinage of the year before (1815), which it felt was in itself enough to show the exaggeration of the fears of the delegates, without taking into account the balances in the provincial subtreasuries and provisional mints. Finally it urged the King to take the measures recommended earlier and so help the industry and the Tribunal.<sup>104</sup> Nothing came of the movement to suspend

<sup>104</sup> This dispatch of the Tribunal is in *A.J., Sec. 5, Aud. de Méx., Leg. 2237, expediente 23*.

the Tribunal and the School. No reply came from the government until 1818; in a cedula of June 5th of that year the King acknowledged the receipt of the proposals of the Junta General and the views of the Tribunal, but made no decision, simply instructing the Viceroy to send his opinion after consulting the audiencia.<sup>105</sup>

The Tribunal's efforts to get relief from taxes were not limited to the representation of June 30, 1815. On May 15th it addressed an urgent plea to the Viceroy asking that he disapprove a proposal of the *Junta de Arbitrios* that the convoy tax on silver bullion be doubled and the alcabala be imposed at rates varying from 9 to 25 per cent even on privileged articles such as mine supplies. The Tribunal said that if these proposed taxes were put into effect they would complete the ruin of the mining industry. It expressed regret that it was forced to oppose the government at this critical time, but reminded the Viceroy of the patriotism of the mining industry and its aid to the Royal Treasury. The Tribunal reminded the Viceroy that the price of silver was fixed and that miners could not pass on taxes to the public as the merchants could — and furthermore that they had their own exclusive taxes. The representation concluded by saying that what was needed was repeal of some of the existing taxes and not the imposition of new ones.<sup>106</sup>

At the end of June of this same year (1815) a *Junta de Hacienda* in Guanajuato decided that it would be necessary to impose a special tax of one real on each marc of silver produced in Guanajuato for the maintenance of the royal troops in that province. On August 29th the fiscal of the Tribunal wrote an opinion concurred in by the Tribunal to the effect that such a tax would only hasten the ruin of the once prosperous Real de Guanajuato. The Viceroy replied on September 3d that the tax was necessary for the maintenance of the troops

<sup>105</sup> *A.G. Cédulas*, vol. 218, No. 324.

<sup>106</sup> Tribunal to Viceroy, Mexico, May 15, 1815, *A.J., Sec. 5, Aud. de Méx.*, Leg. 2237, expediente 30.

and had been agreed on by a junta of the leading citizens including the senior mining deputy. Notwithstanding this, the Tribunal renewed its protest on September 9th, seemingly to no avail.<sup>107</sup>

In 1816 the representations for relief from taxes were renewed. On July 20th the Tribunal once more wrote the Viceroy saying that it had received no reply to its representation of May 15, 1815, and insisting that the special war taxes were doing immeasurable harm. The royal order of August 8, 1814, confirming the exemption from the alcabala, was mentioned as being disregarded and the arguments of the preceding year repeated.<sup>108</sup> On October 14th of the same year a representation was sent directly to the *Secretario de Hacienda*, describing the plight of the industry,<sup>109</sup> and asking for the repeal or modification of the regular taxes on silver. This asked that as a general rule all the royal taxes on silver be reduced to one-half the existing rate for the time being; and that mines damaged seriously by the revolution and having to undertake extensive drainage projects or other measures of recovery be exempted entirely from the royal taxes for a term of years.<sup>110</sup> As we shall see, these pleas for tax-relief eventually had their effect, but not until 1821 when it was too late to do any good.

According to the Viceroy Apodaca the mining situation showed some improvement in 1817. On June 27th he wrote the Ministry of Hacienda that, due to his own constant efforts in behalf of the mining industry and the victories over the rebels, the "Reales del Oro, Angangueo, Sultepec, Temascaltepec, and Tlalpujahua, the mines of the province of Oaxaca, and many others of the district under my command, which were totally abandoned now produce some ore and give employment to many hands . . ." <sup>111</sup> He added that to help relieve the poorer

<sup>107</sup> *Ibid.*

<sup>108</sup> *Ibid.*

<sup>109</sup> Cf. above, p. 395.

<sup>110</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2250, expediente C2.*

<sup>111</sup> *A.G. Virreyes, Ser. II, vol. 3/27/274, 149.*



miners he had asked from the Tribunal an account of its fund, its income and expenditure; and, upon receiving this, had ordered the Tribunal to economize as much as possible on its own expenses and those of the School so that a large part of its income could be used in aiding miners. While undoubtedly the Viceroy was well-intentioned, he does not appear to have been very well-informed as to the burden of the debt of the Tribunal. Furthermore, he made no mention of the tax situation and the pleas of the Tribunal to his predecessor Calleja.

In this year also there was addressed to the King an interesting discourse by the Conde de Pérez Gálvez, who described himself as a miner of Guanajuato and a resident in Mexico for thirty-four years. This was a lengthy document involving proposals for the reform of the whole administrative and fiscal system of New Spain, but we need only consider the suggestions made concerning mining.<sup>112</sup> The writer mentioned the plight of the industry and said that measures to aid it were being considered by the Superior Government in Mexico. Of those brought forward he considered the following the most useful: (1) The halving of the royal taxes on gold and silver for a term of eight years; (2) that quicksilver be distributed through the subtreasuries as formerly, rather than as an article of free commerce; (3) that all the extraordinary and local taxes on silver and the working of mines be abolished; and (4) that an ample supply of cash for the purchase of silver be maintained in the provincial subtreasuries at all times, or else provisional mints be established — especially in Guanajuato. It will be noted that these proposals had all been made previously by the Tribunal at various times. Notwithstanding this, Perez Gálvez followed these suggestions with a violent indictment of the Tribunal. He said that whereas under other circumstances it could have been of great benefit to the industry, it had been, and was at the time, of no service whatsoever.

<sup>112</sup> This document is dated in Mexico, Sept. 1, 1817, and is in *A.J.*, Sec. 5, *Aud. de Méx.*, Leg. 2249, expediente G.

Where it should have had available large sums for the aid of mines, it had not only spent its sizable income but contracted a huge debt and was on the verge of a scandalous bankruptcy. He charged that the Tribunal had abused its powers, that many of its ministers had taken large sums for themselves, and that it had accepted complacently the shortage in the accounts of its factor and even continued him in his position. The solution for these shortcomings in his opinion was to give the delegates to the Juntas General an effective voice in the management of the affairs of the Mining Guild instead of only the right to give advice. He said if this were done they would soon see to it that the sums owed the Tribunal were collected, that the salaries of the ministers were abolished (since they should serve without pay like the provincial deputies), and that the expenses of the School were drastically reduced. While the criticisms of the Tribunal were fairly well justified, the suggestions do not seem to have been very constructive. It is probable they would have had a salutary effect if the Junta General had been able to exercise some control over the Tribunal, but it is doubtful whether cutting off the salaries of its ministers would have raised their caliber.

The Junta General which was held in 1818 did succeed in bringing about some economies, since, with the approval of the Tribunal and the Viceroy, it decided not to elect a deputy-general to fill the vacancy occurring, and also reduced the salary of the associate judge of appeals of Mexico from \$4500 to \$1500.<sup>113</sup> This was not done without some discussion. The delegate from Temascaltepec, Fermín de Reygadas, proposed that instead of reducing the number of deputies to two, the salaries of all of them be reduced to \$3000 per year.<sup>114</sup> The Tribunal opposed this suggestion so strongly that not only did

<sup>113</sup> Apodaca to Ministry of Hacienda, Nov. 30, 1818, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2249, expediente 14.

<sup>114</sup> It will be remembered that this Reygadas had in vain sought a post on the faculty of the School.

it have no chance to pass, but it was not even mentioned in the minutes. Reygadas felt that, considering the debts of the Tribunal, \$3000 was a sufficient salary, and that it was of great importance that there be three deputies. He believed that if the proposal had been recorded and brought to the attention of the Viceroy, the latter might not have approved the suspension of the election of the deputy. Hence he urged that the King order the filling of the vacancy and the reduction of the salaries.<sup>115</sup> This refusal to consider a reduction in their own salaries at the same time that they approved a cut of two-thirds in that of the associate judge of appeals does not show the Ministers of the Tribunal in a very favorable light. Nevertheless, after considering both the Viceroy's letter and Reygadas' complaint the King dismissed the latter and ratified the action of the Junta as approved by the Viceroy.<sup>116</sup>

In spite of Apodaca's assurances in 1817 that he was devoting himself heart and soul to the restoration of the mining industry, the Tribunal was not very much impressed with his activity, and in August 1818 it addressed five representations to the crown discussing the situation and making specific recommendations.<sup>117</sup> The first one really included all the arguments, the others simply enlarging on the different suggestions. This began by complaining of the indolence of the Government of New Spain in dealing with the misfortunes of the mining industry which the Tribunal had called to its attention repeatedly. It reiterated the familiar statement that mining demanded the fullest degree of protection from the government as it was the root of all prosperity of New Spain and the income of the Treasury. Furthermore it charged that, with

<sup>115</sup> Reygadas to Ministry of Hacienda, Mexico, Oct. 26, 1818, *A.I., Sec. 5, Aud. de Méx.*, Leg. 2249, expediente 4-I.

<sup>116</sup> José de Yinzas to Apodaca, Madrid, July 25, 1918, *A.G. Cédulas*, vol. 221, No. 46.

<sup>117</sup> These are all signed by Elhuyar, Fagoaga, Eguía, and Septién, and are in *A.I., Sec. 5, Aud. de Méx.*, Leg. 2237, expedientes 35-40; the fifth one has already been discussed above, p. 400.

nothing being done, the evils were increasing and would result in delaying the pacification of the country. The representation then turned to the recommendations which the Tribunal felt would make possible the rebirth of the industry. These were:

1. A steady supply of quicksilver at moderate prices.
2. Reduction of the quinto, and complete exemption from this for ten years.
3. Continuation and extension of the provincial mints.
4. Abolition of the extraordinary taxes imposed by the Government of New Spain.

The Tribunal said that all these suggestions had been made to the government repeatedly, but that the latter had been so indifferent that it had not even replied to the representations of the Tribunal, "and to this apathy is due the decay of the miners and their establishments, and the complete destruction of the Real de Guanajuato, the veritable Potosí of New Spain, and the most marvelous mineral region of the world, which has come to be sadly forsaken by its inhabitants."<sup>118</sup> In view of these circumstances, the Tribunal begged prompt consideration and action from the royal government.

As has been said, the other representations simply enlarged on the points mentioned above. Thus the second one emphasized the burden of emergency taxes in the same terms as the earlier complaints to the Viceroy. It particularly objected to the collection of the alcabala on quicksilver in violation of numerous royal orders, and the arbitrary exactions of provincial military commanders. The others enlarged on the subject of quicksilver and the desirability of provincial mints, particularly as an aid in the suppression of the irregular coinage of money.

These representations were forwarded to the Ministry of Hacienda by the Tribunal's attorney in Madrid, D. Manuel de Quevedo Bustamante, on November 14, 1819.<sup>119</sup> In doing so

<sup>118</sup> *Ibid.*, expediente 35.

<sup>119</sup> *Ibid.*, expediente 34.

he emphasized the point that it had been impossible for the Tribunal to get any action from the government in New Spain and begged the Ministry to intervene. The year before, on December 2, 1818, Bustamente had forwarded to the government a copy of Elhuyar's *Indagaciones*, with the request that, pending the determination of a permanent policy, some of the fees collected in the mint, as described therein, be abolished.<sup>120</sup>

Finally in 1821, when it was already too late, the efforts of the Tribunal had their effect in a series of important measures relating to the future of the mining industry in Mexico.<sup>121</sup> The first of these was embodied in a dispatch from the *Gobernación de Ultramar* to the *Gefes políticos* of Peru and New Spain, dated January 25, 1821.<sup>122</sup> It ordered them to appoint juntas consisting in each case of the director of the Tribunal, a distinguished miner, and a lawyer experienced in mining matters, who should consider how the *Fuero minero* could be harmonized with the new constitution of Spain. These juntas were to seek the opinions of the provincial deputations and any informed persons; they were to consider especially amendments to that part of the Ordinances concerning contentious jurisdiction, but were also to recommend any other changes deemed desirable. After forming its recommendations the junta was to report them to the Tribunal itself, which, after holding hearings, was to forward them with a statement of its own views to the Viceroy for comment and transmission to Spain. By this means it was hoped to bring about an intelligent reform of the Ordinances, to correct former abuses, and make them harmonize with the liberal constitution and modern ideas.

The next measure promised no direct benefit to the miners of New Spain, but is of considerable interest. On December 20, 1820, the *Secretario de Ultramar* wrote an opinion as to

<sup>120</sup> *Ibid.*, expediente 26.

<sup>121</sup> It is ironic that the event which was responsible for the reforms described here, namely the adoption of the liberal Spanish Constitution of 1820, was also responsible for the independence of Mexico which rendered them of no effect.

<sup>122</sup> *A.I., Sec. 5, Aud. de Méx., Leg. 2250, expediente B3.*

what should be done to improve the mining industry of America. He wrote first of the importance of mining, of the prosperity it brought to the communities where it existed, and of the wealth it created for the benefit of the whole people. He then said that the mineral resources of America were virtually untouched except in Peru, Santo Domingo, and New Spain, and that even in these regions the known deposits had been inefficiently exploited. He said that New Spain was the only region where the modern scientific principles of mining were understood, and credited this to the School of Mines. He therefore recommended that the Viceroy of New Spain be authorized to choose two graduates of the School to go to Peru, one to take charge of the quicksilver mines of Huancavelica, and the other to tour the various mining centers to instruct the miners in modern techniques of mining and refining. Similarly a graduate of the School was to be sent to the Philippines and another to Guatemala to study and report on the mineral resources of those regions. All these men were to be paid by the royal treasuries of the regions to which they were sent. Finally the *Tribunal de Minería* of Lima was to select two boys to be sent to the School in Mexico at its expense and to urge individual miners who could afford it to send their sons there. All these recommendations were approved by the King and were embodied in a dispatch of February 25, 1821, from the *Gobernación de Ultramar* to the *Geje político de las provincias de Nueva España*.<sup>123</sup>

These two measures are of interest as showing that the Cortes, meeting in accordance with the Constitution of 1820, were alive to the necessity of aiding the miners of America. This was probably due to the presence of such Mexican miners as Lucas Alemán, deputy from Guanajuato. These first gestures were, however, designed more for the long-term effect than to afford immediate relief or assistance in rebuilding the

<sup>123</sup> Both these documents are in *A.I., Sec. 5, Aud. de Méx.*, Leg. 2250, expediente Br.

industry. The latter object was reserved for the last enactment of all. On May 24, 1821, a special committee appointed by the Cortes to consider the problem of mining brought in its report. This was based largely on Elhuyar's *Indigaciones*, and recommended immediate adoption of virtually all the measures for which the Tribunal had been clamoring for nearly a decade, including a radical modification of the whole system of taxation.<sup>124</sup> The report of the committee was approved by the Cortes and embodied in a royal decree of June 8, 1821.<sup>125</sup> This abolished the quinto, *uno por ciento*, and seigniorage and substituted therefor a single tax of 3 per cent on gold and silver to be paid in the same manner as the quinto had been. It provided further that miners were to be absolutely free of any other tax except the contribution to the Mining Fund and general municipal taxes. It ordered that all fees and other charges relating to coinage should be abolished and the miners charged only the actual cost of the minting of gold and silver — this cost to be redetermined every five years. In the same way the charges made for the assaying and refining of bullion brought in and the separation of gold from silver were to be limited to the actual cost. Article IX provided that once the 3 per cent was paid in the subtreasuries and the bullion stamped, the owners should be free to dispose of it as they pleased. Article VIII ordered strict observance of the various orders exempting mine supplies from the alcabala. By Article XI all the extraordinary taxes established during the revolution were summarily abolished. In Article XII, the government was ordered to see that a constant and sufficient supply of quicksilver was furnished to the provincial deputations for distribution to the miners and that ample reserves were held in Mexico for emergencies. Finally, by Article XIII it was

<sup>124</sup> The report of this Committee is given as an appendix to the Spanish edition of Alexander von Humboldt's *Ensayo político sobre el reino de Nueva España*, 4 vols. (Paris, 1822), III, 385-418.

<sup>125</sup> *A.G. Cédulas*, vol. 225, No. 123; *A.I., Sec. 5, Aud. de Méx.*, Leg. 2250, expediente B7.

ordered that in the future all applicants for positions in the mints and assay offices should be examined in physics, chemistry, and mineralogy, and that preference should be given to graduates of the School of Mines. Article XIV limited the effect of this decree to North America.

The decree was sent to the *Geefe político de Nueva España* by the *Gobernación de Ultramar* on July 15, 1821.<sup>126</sup> It must have arrived in Mexico soon after O'Donoju and Iturbide signed the Treaty of Córdoba, which recognized the independence of the country from the government which had issued this decree. One cannot help wondering what would have been the effect if this step had been taken five or six years earlier. With the course of events in Europe what it was, and independence actually brought about by the reactionary forces in Mexico, it is doubtful whether such a measure could have had much political effect. And yet a prosperous society is much less subject to change than one suffering from economic stagnation, and it is quite possible that if these concessions had been granted earlier they might have supplied the stimulus for a substantial recovery in the mining industry.

Such was not the case however. Like so many important measures in Spanish history, this decree came too late.<sup>127</sup> By the time it arrived nothing could save Mexico for Spain, and the *Tribunal de Minería* was about to swear allegiance to the new independent government. On October 22, 1821, Elhuyar, so many of whose ideas were embodied in this decree, bade farewell to the Tribunal, and with that event the curtain falls on the organization as we have studied it.<sup>128</sup> This does not mean that the Tribunal ceased to exist immediately independence was achieved. The old organization was continued with modifications until the adoption of the Federal Constitution of

<sup>126</sup> *A.G. Cédulas*, vol. 225, No. 123.

<sup>127</sup> On Feb. 20, 1822, the *Junta Provisional Governativa of Mexico* issued an order embodying the terms of the Royal Cedula in their entirety, so it was not without effect; Ramirez, *Colegio de Minería*, p. 252.

<sup>128</sup> Ramirez, *Colegio de Minería*, p. 248.



1824 when the mining administration was decentralized. Similarly the School of Mines continued for many years, and in an altered form exists today; while the *Ordenanzas de Minería* of 1783 were the bases for Mexican mining law until the time of President Díaz.<sup>129</sup> Even though the old forms persisted, their functions were bound to be altered by the very fact of independence and the varying exigencies of domestic politics. Hence it is proper to close the story of the Mining Guild with the cessation of Spanish rule.

It would not be right to conclude without a word as to what happened to Fausto de Elhuyar, the director who gave such loyal service to the miners of New Spain and in the end remained loyal to the royal government. After turning over all his records to D. Miguel Septién, the administrator of the Tribunal, on November 9, 1821, the next word we have of him places him in Spain in the middle of 1822. On June 15th of that year he wrote the Minister of Hacienda recalling his services to the crown and saying that upon the declaration of independence he had left Mexico with his family and returned to Spain where he now found himself without funds. He petitioned for a pension such as was given other royalist *émigrés* from America, and for appointment to some position in the royal service where his knowledge would be of use. It is gratifying to know that by a royal order of July 19, 1822, Elhuyar was granted the sum of \$12,000 and the ministers ordered to find a position for him in the mining or coinage administration where his experience would be of value.<sup>130</sup> Subsequently he was appointed *Director General de Minería* of Spain, a position where his ability and experience could continue to be of great service to the country. In this position he prepared the draft of a new mining code for Spain and continued active until his accidental death on January 6, 1833, as a result of a fall down the steps of the *Dirección General de Minas*.<sup>131</sup>

<sup>129</sup> *Ibid.*, p. 253 ff.

<sup>130</sup> *A.I., Sec. 5, Aud. de Méx.*, Leg. 2250, expediente Cr.

<sup>131</sup> Arturo Arnaiz y Frez, "D. Fausto de Elhuyar y de Zubice," *Revista de*

Now that we have completed the picture of the Tribunal and the organization which it headed, the question of its ultimate significance remains to be determined. What did it contribute to the development of the country, either political or economic? Did it benefit the miners and the industry as a whole? How fully did it fulfill the purposes of its creation? Finally, what light, if any, does it shed on the ability of native Mexicans to administer the affairs of a body politic and corporate? Before drawing conclusions of our own it will be instructive to record the judgment of two or three contemporaries who were well qualified to form an opinion.

Reference has already been made to an essay written by Elhuyar in 1813 entitled *Reflexiones sobre la constitución actual del Cuerpo de Minería de Nueva España*.<sup>132</sup> This is a long and careful discussion of the various agencies making up the *Cuerpo de Minería* and an expression of the director's opinion as to how they had discharged the objects of their creation. In general, his opinion was distinctly unfavorable and gives an impression of almost complete failure. He began with a study of the provincial deputations. Since this did little more than repeat and confirm the observations which he made in 1791 and which were studied in detail in Chapter V, this section need not detain us long. Apparently twenty years had done nothing to improve his opinion of the provincial deputations. He emphasized once more the lack of qualifications in most of the

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*historia de America*, No. 6, pp. 75-96; Elhuyar's draft of a mining code for Spain is published as *Memoria sobre la formación de una ley orgánica para gobierno de la minería en España*, Feb. 3, 1825, in Rafael Cabanillas, *Anales de Minas*, 4 vols. (Madrid, 1841-1846), I, 1-153.

<sup>132</sup> Cf. above, p. 383; this is the second of three *Discursos sobre la Minería y su gobierno en general, constitución actual de la de Nueva España, y reformas convenientes en ella*, dated May 7, 1813, and found in *A.I., Sec. 5, Aud. de Méx.*, Leg. 2250, expediente Cr. The first is a general history of mining legislation in Europe and America; the third, containing Elhuyar's recommendation for reform, will be mentioned below. According to Elhuyar's introduction to these discourses, they were written as a result of the general governmental and administrative reforms embodied in the Spanish constitution of 1812 and the changes in the colonial administration under consideration by the Cortés.

deputies, and their complete failure to carry out the administrative duties entrusted to them or to promote the welfare and progress of their districts. In the sphere of contentious jurisdiction, he said that the changes made in 1793 had resulted in little improvement, as the royal judges and intendants were ignorant of mining, occupied with other duties, and tended to dominate the deputies. Hence he concluded that the local administration of justice was no better than before the adoption of the Ordinances of 1783.

Elhuyar turned next to a consideration of the Juntas General and concluded that they too had failed to fulfill expectations. This was due to the fact that most of the mining centers did not send delegates in person but named residents of Mexico as proxies. This meant that the members of the juntas had no personal knowledge or experience of the districts they represented to bring to the meetings, either for the purpose of elections or for intelligent discussion of problems confronting the industry. Hence these juntas did little but go through the formality of electing members of the Tribunal. He said that even these elections did not carry out the spirit of Ordinances, since, instead of each deputation sending in a list of the names and qualifications of all persons whom it considered eligible, many districts failed to send in any list, and those which were submitted usually were incomplete. Thus the field of choice for members of the Tribunal was unduly limited. This brought him to some observations on the personnel of the Tribunal. He expressed the opinion that even if the members of the Juntas General had been in a position to choose the best men in the country, it would have been hard to prevail on them to serve. He pointed out that few miners were residents of Mexico City and said that the good ones of the provinces did not want to leave their businesses for nine years. Hence he concluded that the term was too short to afford an attractive career in itself, and too long to be filled by first-class men with active interests of their own; the result had been that the positions

had been sought by men who had failed in their own affairs and who were attracted by the salary.<sup>133</sup>

He then turned to the activities of the Tribunal itself. In the field of contentious jurisdiction, he said it had not succeeded in simplifying procedure, and had relied too much on the opinion of its assessor rather than deciding cases itself on their merits. Many cases were, in practice, decided both in first and second instances by lawyers, and the miners were not getting the benefit of judgment by persons experienced in mining as intended by the Ordinances.

In the field of administrative activity, he said that the Tribunal had done practically nothing since its creation in the way of promoting prosperity of the industry or informing itself of the condition, production, or misfortunes of the various *reales de minas*.<sup>134</sup> This, he admitted, was partly the fault of the provincial deputations. He stated that the Tribunal's activities in this (the administrative) field had been limited to the approval of provincial elections, to handling expedientes raised by the Juntas General, the provincial deputations, or individuals, and to supplying information requested by the Viceroy; and that "its principal and regular occupation has been contentious matters and the handling of its funds."<sup>135</sup>

This brought him to a discussion of the manner in which these funds were handled. We have already described his observations on this point;<sup>136</sup> hence we need not go into it here, except to recall that, while it was very unfavorable, it was tempered with the realization that most of the later difficulties had arisen from the loans and gifts to the crown.

He next discussed the courts of appeal. He said that as first

<sup>133</sup> This would scarcely seem to be true of such men as the Conde de Regla, the Marqués de San Juan de Rayas, or the Fagoagas, at least before 1810.

<sup>134</sup> While this may be literally true, it does not take into consideration the various privileges granted the industry by the crown at the instance of the Tribunal.

<sup>135</sup> *Reflexiones* . . . , f. 23.

<sup>136</sup> Cf. above, p. 383.

established under the Ordinances there had been great inequality in the quality of justice administered in the different courts, and particularly between the provincial ones and that of Mexico. While he felt that the changes of 1793 had improved the system somewhat, at least for the districts whose appeals came to Mexico, he said the inequality still persisted as between the court of appeals of Guadalajara and the Tribunal and court of appeals in Mexico to such an extent that many miners in the district of the former preferred to travel the greater distance to bring their appeals to the Tribunal. He made the same criticisms of the court in Guadalajara that had been made by the Tribunal and the provincial deputations in 1794-1796. While he felt that that of Mexico was better, he said the consultores were usually not qualified to act as substitute justices.

Finally Elhuyar appraised the School of Mines of which he himself had been the active head. He said that the professors should devote more time to research than they had in the past, taking advantage of the facilities offered by the new school building in the way of laboratories and equipment. One reason for the lack of research in the past had been the shortage of equipment in the early years and the fact that there were no suitable rewards to encourage them. He urged that some incentive be provided to persuade able men to take up teaching careers in the School, and reported that one suggestion being considered was to make the professors of mineralogy and metallurgy consultores of the Tribunal with a presumptive right to succession to the directorship. Charging that that lack of coöperation from the provincial deputations had lessened the effectiveness of the practical work of the students, he also expressed disappointment that the careers of the graduates had not worked out more successfully; while some important mineowners had taken them on as managers with excellent results, most of the miners of the country were still blindly prejudiced against "book learning." The inability of the Tri-

bunal to continue financing mines had contributed toward the lack of opportunity, as had the failure of the provincial deputations to make provision for licensed engineers as required by the Ordinances. For these reasons he said many graduates had been forced to give up the mining career or take merely temporary jobs. He hoped that the future would destroy these prejudices and open up more opportunities. In the meantime Elhuyar noted that the Tribunal had suggested giving preference to graduates of the School in appointments to positions in the Mint and assay offices. He closed on a more encouraging note by recommending that students be sent to the School from other parts of the empire and from Spain itself, as in his opinion the School was the best in the empire, and this practice would save sending pensioners to Germany.<sup>137</sup>

Following this, Elhuyar gave his recommendations for the future.<sup>138</sup> Inasmuch as these were never put into effect they can be summarized by saying that they embodied a much greater centralization of authority under an administrator-general, with provincial administrators subject to him, and with considerable curtailment of the powers of the provincial deputations. He favored continuation of the Tribunal as a court of appeals and the establishment of a second one in Durango; in general, his recommendations included many of the suggestions he had made in his opinion on the arreglo in 1790.

If one accepts Elhuyar's opinion, one is forced to the conclusion that the Tribunal and other organs of the *Cuerpo de Minería* failed utterly to fulfill the purposes of their creation. There was little or no improvement in the administration of justice; through the combined effects of financial mismanagement and the exigencies of the crown the important object of supplying capital for the development of mines failed to be

<sup>137</sup> It will be remembered that these suggestions were given effect by the decree of the Cortés of 1821.

<sup>138</sup> These are included in the third of the *Discursos* cited on p. 435.

realized; neither the Tribunal nor the provincial deputations accomplished anything along administrative lines in the way of aiding the progress of the industry or improving mining practice; and finally the accomplishments of the School of Mines were largely nullified by the prejudice of the miners of the country. And yet, while much weight must be given Elhuyar's opinions, both because of his position and his intellectual honesty, they are subject to some qualifications. Elhuyar was primarily interested in an efficient administration and in the application of scientific methods to the practice of mining and refining. He was little concerned with the liberties of the miners or their desire to manage their own affairs. With him the administrative advantages of a centralized system far outweighed any benefits to be derived from autonomy under a representative or federal system. Therefore, while it is hard to disagree with his judgment that the organization failed to fulfill the objects of its creation, it is not necessary to conclude that it served no useful purpose.

Another able commentator on the institutions of New Spain, Baron von Humboldt, formed a more favorable impression of the organization. He wrote:

It cannot be denied that the representative system followed in the new organization of the body of Mexican miners is very useful: because it maintains the public spirit in a country where the citizens, scattered throughout a territory of immense extent, do not sufficiently realize that they have interests in common; and it affords the Tribunal the faculty of collecting considerable sums for any large and useful enterprise. It would be desirable, however, if the Director could exercise more influence over the practice of mining in the provinces, and if the miners less jealous for what they call their liberty, were better informed as to their true interests.<sup>139</sup>

<sup>139</sup> Alexander von Humboldt, *Ensayo Político sobre el Reino de la Nueva España* (tr. Vincente González Arnao), 4 vols. (Paris: Casa de Rosa, 1822), III, 243; Humboldt was somewhat mistaken as to the actual functioning of the system. He said (pp. 202-203) that the Deputies General were elected from among the territorial deputies, and that the graduates of the School were sent by the Tribunal to the *Reales de Minas* as heads of the various deputations. As we have seen, this was Elhuyar's ideal rather than the existing practice.

This suggests what was probably the real value of the *Cuerpo de Minería*. It did unite the miners of the country in an organization of their own, made them and the whole nation more conscious of its most important industry, and gave them an organ to keep their interests before the crown.

Writing somewhat later, the Mexican historian, Lucas Alemán, gives still another point of view. He too was well qualified to speak from experience, as he was a native of Guanajuato, a graduate of the School of Mines, and had been an active miner in Guanajuato, besides serving on the Committee on Mining of the Cortes in 1821. He described the organization of the *Cuerpo de Minería* and the formation of the Ordinances, and commented:

The plan was without doubt grandiose, but unfortunately the results did not correspond to the expectations. Undoubtedly the profession of mining was ennobled and the tribunals or deputations of the *reales de minas* were of great utility: but the *tribunal general*, as administrator of the funds, caused the mining industry great and lasting harm . . .<sup>140</sup>

He went on to say that while the School had offered a good education, it had failed to fulfill its purpose of providing trained engineers for the *reales de minas* and the miners of the country. He also drew a comparison between the way in which the Tribunal mishandled its financial affairs and the administration of the funds of the Consulado. He said the failure of the former, which was composed mostly of creoles, compared with the good record of the latter, administered by Spaniards, served as a portent for the way which the Mexicans were to administer their national finances in comparison with the efficient administration of the Spanish government. In evaluating Alemán's opinion, we must recognize his prejudices. Not only was he a conservative, but he was a native of Guanajuato. We have seen that an almost constant jealousy of the Tribunal

<sup>140</sup> Lucas Alemán, *Historia de Mejico desde . . . el ano de 1808 hasta la época presente*; 5 vols. (Mejico: J. M. Lara, 1849), 1<sup>a</sup> parte Tomo I, p. 63.



existed among the miners of the most important *real de minas*, and this might account in part both for his harsh judgment of the Tribunal and the good word he spoke for the provincial deputations.

With these comments of persons familiar with the organization in mind, we can attempt to appraise the ultimate significance of the organization of the Mining Guild. Except for the development of an *esprit de corps* and sense of common interest among the miners, we must conclude that it failed to realize most of the specific objects of its creation. Much of this failure can be ascribed to shortcomings in the personnel which administered the system. The system itself, as envisioned by Velásquez de León and Lassaga, and established by the Ordinances, appeared to be well conceived and to offer most interesting possibilities. It was an ideal, however, which, like the later constitutions of Mexico, failed to take into account the weakness of the human agents who were to administer it. Also, like these constitutions, the system in retrospect seems to have been ahead of its time. The mistake probably consisted in instituting a new administrative procedure and placing it immediately in the hands of persons unused to responsibility or authority. If the system had first been established more according to Elhuyar's ideas of centralization, and then, after the duties and work of the various agencies had become fixed and modified by actual experience, an elective and representative personnel had been introduced gradually, there would have been a better chance of success.

Under the circumstances, it was probably inevitable that the majority of persons eligible for election as local deputies lacked the character or experience to discharge the important duties entrusted to them. This was not entirely their fault; for the most part they were uneducated and without administrative experience. Furthermore, the examples of the local agencies of the royal government had done little to inspire them with high ideals of public service. Favoritism, corrup-

tion, and self-interest were the rule, especially among the minor officials; and the new deputies could scarcely be expected to conform to a standard other than that they had known.

There is not the same excuse for the failure of the Tribunal to attain the standard set for it in the Ordinances. Even if we grant Elhuyar's argument that the length of the term discouraged the best men from serving on the Tribunal, it was staffed by educated men of rank and position from the "governing class" insofar as such a class existed among the creoles in the colony. But they could not resist the temptations of power, and in the handling of finances they exhibited a carelessness, to say the least, that boded ill for the time when their class would rule the nation. Nor were they able to cut the red tape and reliance on legists that had always been the curse of Spanish officialdom and which the framers of the Ordinances had themselves recognized as such an evil in handling of mining affairs. Just as the success of the United States' experiment in self-government was due more to the English heritage than any magic powers inherent in the free air of America, so in Mexico the fact that this system was administered by native Americans did not mean that they could shake off the traditions of their racial past.

It is hard to lay the blame for the failure of the miners' organization on any shoulders but their own. It is true that the funds of the Tribunal were seriously embarrassed by the gifts and loans to the crown, and allowance must always be made for this in passing judgment on the financial stewardship. But, on the whole, the Tribunal and the other organs of the Mining Guild were given a remarkably free hand. The crown always looked upon the organization with favor. While the *audiencia* viewed the Tribunal with mistrust, the latter usually received the support of the Viceroy, and on most of the few occasions when he tried to interfere with its affairs the crown rebuked him. In fact, it is really the Spanish Government that emerges with most credit from this whole enterprise. While

Velásquez de León and Lassaga may be said to have been the prime movers with their Representation of 1774, it should be remembered that the former had accompanied José de Gálvez on his tour of New Spain and had undoubtedly discussed the project with him. At any rate it was the vigor of Bucareli and Gálvez that brought reality out of the proposal. The establishment itself and the approval of the Ordinances were evidence of an intelligent and liberal interest in the welfare of the mining industry by the Government of Charles III. Nor did this cease with the promulgation of the Ordinances. The sending of the German engineers and workmen and their maintenance at the expense of the crown was a further example. Even after the exposures made during the course of the reorganization the government did not seriously limit the freedom of the Mining Guild.<sup>141</sup> If the lack of interference in later years was perhaps due more to apathy than any positive interest in the autonomy of the miners, it nonetheless left the Tribunal a free hand.

Admitting that the performance of the Tribunal was most disappointing, was it, as Alemán implied, nothing but a burden on the miners, or did they derive benefits from it in spite of its shortcomings? On the whole the latter seems to have been the case. In this connection we should recall the "apologia" which the Tribunal presented to the junta general in 1815. While it was biased and naïve in many ways, some of its arguments appear well-founded. It is doubtful whether the double seigniorage would have been terminated without Lassaga's and Velásquez de León's representation; and the abolition of this left the miners with a clear gain of four grains in the marc until the loans to the crown forced the collection of a full real by the Tribunal. Beyond this, the miners received important concessions from the government during the period under consideration. These included the exemption from the alcabala, a

<sup>141</sup> It will be remembered that the King ruled that the Tribunal did not have to submit its accounts to the *Tribunal de Cuentas*.

reduction in the price of powder, and the maintenance of the lowered price of quicksilver during the various wars in spite of the desire of the Treasury to raise it. These concessions meant much to the miners of New Spain and the country itself. They gave the former a greater profit and permitted the working of low- and medium-grade deposits which had hitherto been unprofitable. All of these favors were granted at the instance and through the efforts of the Tribunal. It may be argued that they would have been granted in any case; but it is doubtful whether the crown would have made these concessions had there been no formal body to speak for the miners. In some ways even the loans to the crown may have been of negative benefit to the miners. The government had to have the money, and if the Tribunal had not been able to borrow it from individuals and corporations it is questionable whether the miners could have escaped direct taxation far beyond the impost they paid to the Tribunal. All in all it would seem that the miners derived a considerable net benefit from the existence of the Tribunal.

It is probable, too, that they benefited from the provincial deputations. While, as we know, Elhuyar had a very poor opinion of them, Alemán felt they had been of value. The miners did not have the same standards of efficiency as Elhuyar. What they sought were local courts composed of miners of their own choosing. These they received; and from the objections made in 1793-94 to the addition of royal judges, it appears that they were satisfied. There were undoubtedly abuses, inefficiency, and corruption; but these there had always been, and such vices are more readily forgiven when the responsibility for choosing the officials rests with oneself, and when within a short time one will find oneself in the position of authority.

There is also the question of the psychological effect of the organization on the miners. There can be little doubt that the formal recognition of the industry gave an added dignity to the

profession. Its attraction was increased also by the virtual assurance that every miner of substance would at some time serve as a local deputy, and the chance for the more prominent ones to be elected to the Tribunal. To feel oneself an official in, or even a simple member of *El importante Cuerpo de la Minería de la Nueva España* was more satisfying than to be merely an individual in some rude mining camp far from the metropolis. This sense of unity and common interest, commented on by Humboldt, was a factor of real significance. The mining industry was by nature decentralized and before the establishment of this organization there had been little to give it any coherence.

The influence of the Tribunal on the production of silver and gold is hard to assess. All figures show that it reached higher totals during the period of the Tribunal's existence than at any time previously or for half a century thereafter. It seems probable that it did have at least an indirect influence. By raising the reputation of mining and providing a formal body to represent it, the new organization attracted both men and capital to the field. This led to the development of new mines and the reopening of old ones. The concessions granted the industry at the instance of the Tribunal permitted the working of deposits hitherto unprofitable. All this, combined with the natural growth of the country, resulted in the steady increase in production. Writing on this subject in 1794 Revillagigedo said,

The causes of this increase are not that there have been greater bonanzas or metal of a higher grade; it is due principally to the greater number of persons who have devoted themselves to mining, some slight improvement in refining methods, the concessions in regard to the price of quicksilver, the lowering of the price of powder, and the exemption from *alcabalas*.<sup>142</sup>

Inasmuch as the formal organization of the Mining Guild and the Tribunal were responsible directly or indirectly for most

<sup>142</sup> Revillagigedo, *Instrucción reservada*, p. 468.

of these factors, it seems fair to credit them with a good share of the increased production of this era. In this way they were of definite service both to the nation and the crown.

Beyond these varied benefits which the organization brought to the mining industry and the nation in spite of its shortcomings, the Tribunal left two great monuments which outlasted its own existence. These were the Mining Ordinances and the School of Mines. We have seen that the Ordinances were in fact drawn up by the Tribunal in the years immediately following its creation in 1777. It is true that the authors drew on the earlier mining laws of Spain and America and on the celebrated commentaries of Gamboa, and also that the original draft was modified somewhat by the government in Spain. But these facts do not lessen the credit which is due the Tribunal for the formation of this great code. The significant thing is that it was drawn up by creoles who were miners and personally familiar with the mining problems of the new world rather than by lawyers or Spanish officials. This is perhaps the reason why it endured. While the Tribunal as we have studied it barely outlasted the Revolution, this code remained the basis of Mexican mining law until the time of Díaz. Even as late as 1881 the Ordinances were of sufficient importance to be published in a new edition with the later amendments and modifications.<sup>143</sup> Nor was their influence limited to Mexico. Soon after the gold rush to California they were published in an English translation in San Francisco.<sup>144</sup> They had no sooner been promulgated than they were made the mining law for Peru and the other Spanish colonies in America, and because of this fact had a great influence over the later mining codes of virtually all South America. Therefore when we pass judgment on the

<sup>143</sup> *Ordenanzas de Minería y colección de los Ordenes y decretos de esta materia posteriores a su publicación*, Nueva edición (Paris and Mexico, 1881).

<sup>144</sup> Henry W. Hallock (ed.), *A Collection of Mining Laws of Spain and Mexico* (San Francisco, 1859); on the influence of Mexican mining laws on the United States see also Harry Bernstein, "Spanish Influences in the United States," *H.A.H.R.*, Vol. XVIII, No. 1.

careless manner in which the first members of the Tribunal discharged their duties, the formation of these Ordinances should be remembered to their credit.

The other great accomplishment was the establishment of the School of Mines. While it was a European, Elhuyar, who drew up the detailed plan for its operation and served as its first director, it was conceived by Mexicans. Lassaga and Velásquez de León suggested the general idea in their representation of 1774, while it was fully developed in Title 18 of the Ordinances, of which Elhuyar's plan was in essence an elaboration of the details. Attention has already been called to the advanced plan of the course, with its combination of an integrated sequence of theoretical instruction with practical training and research. It was staffed with able professors and in time supplied with the most modern equipment. Alemán charges that it failed to fulfill its function of supplying all the mining centers with trained engineers and improving mining technique, and says that it was conceived on too elaborate a scale. There may be some truth in this, although much of the failure must be laid to the prejudice of the miners against theoretical training and failure of the provincial deputations to provide for resident engineers as required by the Ordinances. It might have worked better if the government had not insisted that it must open with all twenty-five endowed students but had followed Elhuyar's suggestion of admitting six or seven each year. The delay in getting instructors and equipment from Spain undoubtedly handicapped it at first. It was not perfect, of course. But in the conservative atmosphere of colonial Mexico it represented a real achievement in scientific education and one of which any country might have been proud in that day and age. Furthermore, like the Ordinances, the School of Mines outlasted its creators. From it came many political and intellectual leaders of the Republic. It was the pioneer of scientific education in America, and even though it may not have maintained its leading position, its tradition is carried on

today in the Engineering School of the University in the same building which the Tribunal built to house its School of Mines.

It is fitting that this history of the Mining Tribunal of New Spain and the organization of which it was the head should close with mention of these two accomplishments which were of enduring significance. In it there has been disillusionment, evidence of pettiness, and at times a sense of futility. Much of the story is one of high hopes and purposes unfulfilled because of human weakness. In this it displays on a small scale what was to be a characteristic of the nation's history. Later events proved clearly that the Mexicans in 1820 were not prepared to meet the problems of an independent representative democracy. To those who were able to read it, this fact should have been evident from the lesson of the semi-independent and partially representative organization of the *Cuerpo de Minería*. Yet on the whole the organization was worth while. It made an articulate body out of a hitherto amorphous collection of unrelated entities. While it failed in many of its objects, it brought tangible benefits to the miners and, through its influence in increasing the production of gold and silver, to the country as a whole.





## APPENDICES



# APPENDIX A

## GOLD AND SILVER COINED IN MEXICO

### FROM 1537 TO 1856

THE TABLES in the following pages are included here to give some indication of the gold and silver production of Mexico up to 1856. Inasmuch as they do not include metal exported to Spain in the form of bullion or used for jewelry, they do not represent the total production. Thus in 1790 over \$1,500,000 worth of silver was sent to Spain as bullion and in the following year \$2,570,684.<sup>1</sup> Inasmuch as such shipments caused special comment they were probably unusual, at least in this period. All that is claimed for these tables is that they record fairly accurately the rise and fall in gold and silver production from year to year. Where possible they have been compared with similar figures from other sources, which in general support the figures given here.<sup>2</sup> It is of interest to note that during the period between the formation of the Tribunal in 1777 and the outbreak of the Revolution in 1810 the average production was higher than at any other time covered by these tables.

#### MONEY COINED, 1537-1731 <sup>a</sup>

Year	Silver	Gold	Total
1537-1550 . . .	22,600,000		22,600,000
1551-1564 . . .	36,400,000		36,400,000
1565-1568 . . .	12,000,000		12,000,000
1569-1580 . . .	36,000,000		36,000,000
1581-1583 . . .	9,000,000		9,000,000

<sup>a</sup> Manuel Orozco y Berra, *Informe sobre la Acuñación en las casas de Moneda de la República*, G. Manuel Siliceo, ed. *Memoria de la Secretaría de Fomento, Colonización, Industria, y Comercio de la República Mexicana* (Mexico, 1857).

<sup>1</sup> *Gaceta de México*, Tomo IV, No. 25, Jan. 11, 1791, Tomo V, No. 1, Jan. 10, 1792.

<sup>2</sup> For example, *Resumen de lo acuñado en Oro y Plata en la Real Casa de Moneda de esta Capital, 1759-1788*. *Ibid.*, Tomo III, No. 32, May 26, 1789; *Estado de las Cantidades de Plata y Oro efectivamente amonedadas en cada uno de los 41 años pasados desde principios de 1733 hasta fin de 1773*, in Bucarelli to Arriaga, Mar. 8, 1774, A.G. Virreyes, sec. II, vol. 23/50, No. 4.

<i>Year</i>	<i>Silver</i>	<i>Gold</i>	<i>Total</i>
1584 . . . . .	3,000,000		3,000,000
1585 . . . . .	3,000,000		3,000,000
1586-1589 . . .	12,000,000		12,000,000
1590-1595 . . .	18,000,000		18,000,000
1596-1603 . . .	19,500,000		19,500,000
1604-1607 . . .	14,000,000		14,000,000
1608-1610 . . .	10,500,000		10,500,000
1611 . . . . .	3,500,000		3,500,000
1612-1621 . . .	35,000,000		35,000,000
1622-1624 . . .	10,500,000		10,500,000
1625-1635 . . .	38,500,000		38,500,000
1636-1640 . . .	17,500,000		17,500,000
1641-1642 . . .	7,000,000		7,000,000
1643-1648 . . .	21,000,000		21,000,000
1649 . . . . .	3,500,000		3,500,000
1650-1653 . . .	15,500,000		15,500,000
1654-1660 . . .	28,000,000		28,000,000
1661-1664 . . .	16,000,000		16,000,000
1665-1673 . . .	36,000,000		36,000,000
1674 . . . . .	4,000,000		4,000,000
1675 . . . . .	4,000,000		4,000,000
1676 . . . . .	4,000,000		4,000,000
1677 . . . . .	4,000,000		4,000,000
1678 . . . . .	4,000,000		4,000,000
1679 . . . . .	4,000,000	6,930	4,006,930
1680 . . . . .	4,000,000	105,820	4,105,820
1681 . . . . .	4,000,000	71,390	4,071,390
1682 . . . . .	4,000,000	50,000	4,050,000
1683 . . . . .	4,000,000	50,000	4,050,000
1684 . . . . .	4,000,000	50,000	4,050,000
1685 . . . . .	4,000,000	50,000	4,050,000
1686 . . . . .	4,000,000	50,000	4,050,000
1687 . . . . .	4,000,000	50,000	4,050,000
1688 . . . . .	4,000,000	50,000	4,050,000
1689 . . . . .	4,000,000	50,000	4,050,000
1690 . . . . .	5,285,581-0-3	50,000	5,335,581-0-3
1691 . . . . .	6,213,709-4-8	50,000	6,263,709-4-8
1692 . . . . .	5,352,729-2-5	50,000	5,402,729-2-5
1693 . . . . .	2,802,378-4-5	50,000	2,852,378-4-5

<i>Year</i>	<i>Silver</i>	<i>Gold</i>	<i>Total</i>
1694 . . . . .	5,840,529-4-6	214,610	6,055,139-4-6
1695 . . . . .	4,001,293-3-7	299,200	4,300,493-3-7
1696 . . . . .	3,190,618-0-8 $\frac{1}{2}$	200,000	3,390,618-0-8 $\frac{1}{2}$
1697 . . . . .	4,459,947-4-10	200,000	4,659,947-4-10
1698 . . . . .	3,319,765-6-9	200,000	3,519,765-6-9
1699 . . . . .	3,504,787-0-6	200,000	3,704,787-0-6
1700 . . . . .	3,379,122-1-2 $\frac{1}{2}$	200,000	3,579,122-1-2 $\frac{1}{2}$
1701 . . . . .	4,019,093-7-4	200,000	4,219,093-7-4
1702 . . . . .	5,022,650-1-0 $\frac{3}{4}$	200,000	5,222,650-1-0 $\frac{3}{4}$
1703 . . . . .	6,076,254-1-6	200,000	6,276,254-1-6
1704 . . . . .	5,827,027-3-6	200,000	6,027,027-3-6
1705 . . . . .	4,747,175-7-2	200,000	4,947,175-7-2
1706 . . . . .	6,172,037-5-4 $\frac{3}{4}$	200,000	6,372,037-5-4 $\frac{3}{4}$
1707 . . . . .	5,735,029-2-4	200,000	5,935,029-2-4
1708 . . . . .	5,737,610-1-10	200,000	5,937,610-1-10
1709 . . . . .	5,214,143-1-5	200,000	5,414,143-1-5
1710 . . . . .	6,710,587-6-8	200,000	6,910,587-6-8
1711 . . . . .	5,666,085-5-6 $\frac{1}{2}$	200,000	5,866,085-5-6 $\frac{1}{2}$
1712 . . . . .	6,663,425-3-7	200,000	6,863,425-3-7
1713 . . . . .	6,487,872-1-3	200,000	6,687,872-1-3
1714 . . . . .	6,220,822-7-0	200,000	6,420,822-7-0
1715 . . . . .	6,368,918-3-0	200,000	6,568,918-3-0
1716 . . . . .	6,527,738-2-10	200,000	6,727,738-2-10
1717 . . . . .	6,750,734-6-3	200,000	6,950,734-6-3
1718 . . . . .	7,173,590-3-2	200,000	7,373,590-3-2
1719 . . . . .	7,258,706-7-2	200,000	7,458,706-7-2
1720 . . . . .	7,874,342-4-6	200,000	8,074,342-4-6
1721 . . . . .	9,460,734-6-6	200,000	9,660,734-6-6
1722 . . . . .	8,823,932-7-2	200,000	9,023,932-7-2
1723 . . . . .	8,107,348-3-9	200,000	8,307,348-3-9
1724 . . . . .	7,872,822-4-9	200,000	8,072,822-4-9
1725 . . . . .	7,369,815-6-9	200,000	7,569,815-6-9
1726 . . . . .	8,466,146-2-9	200,000	8,666,146-2-9
1727 . . . . .	8,133,088-6-10 $\frac{3}{4}$	200,000	8,333,088-6-10 $\frac{3}{4}$
1728 . . . . .	9,228,545-3-9	200,000	9,428,545-3-9
1729 . . . . .	8,814,970-1-6	200,000	9,014,970-1-6
1730 . . . . .	9,745,870-4-0	200,000	9,945,870-4-0
1731 . . . . .	8,439,871-0-0	200,000	8,639,871-0-0

MONEY COINED, 1732-1771 <sup>a</sup>

<i>Year</i>	<i>Silver</i>	<i>Gold</i>	<i>Total</i>
1732 . . . . .	8,726,465-4-0	200,000	8,925,465-4-0
1733 . . . . .	10,024,193-0-0	151,702	10,175,895-0-0
1734 . . . . .	8,522,782-1-6	385,878	8,908,660-1-6
1735 . . . . .	7,937,259-6-6	422,576	8,359,350-6-6
1736 . . . . .	11,033,511-5-0	787,556	11,821,067-5-0
1737 . . . . .	8,209,685-2-6	313,870	8,523,555-2-6
1738 . . . . .	9,502,205-4-0	468,802	9,971,007-4-0
1739 . . . . .	8,694,108-1-6	311,148	9,005,256-1-6
1740 . . . . .	9,589,268-2-6	316,770	9,906,038-2-6
1741 . . . . .	8,655,415-0-6	606,264	9,261,679-0-6
1742 . . . . .	8,235,390-3-6	625,836	8,861,226-3-6
1743 . . . . .	8,636,013-2-6	804,846	9,440,859-2-6
1744 . . . . .	10,303,735-2-6	819,380	11,123,115-2-6
1745 . . . . .	10,428,354-5-6	509,818	10,938,172-5-6
1746 . . . . .	11,524,179-6-0	428,356	11,952,535-6-0
1747 . . . . .	12,883,668-2-6	370,842	13,254,510-2-6
1748 . . . . .	11,644,788-2-0	327,582	11,972,370-2-0
1749 . . . . .	11,898,590-3-0	315,756	12,214,346-3-0
1750 . . . . .	13,228,030-2-0	476,294	13,704,324-2-0
1751 . . . . .	12,657,275-2-0	255,592	12,912,867-2-0
1752 . . . . .	13,701,532-7-0	267,724	13,969,256-7-0
1753 . . . . .	11,607,974-1-0	452,404	12,060,378-1-0
1754 . . . . .	11,608,024-0-0	309,974	11,917,998-0-0
1755 . . . . .	12,606,339-6-0	418,696	13,025,035-6-0
1756 . . . . .	12,336,732-4-0	759,796	13,096,528-4-0
1757 . . . . .	12,550,035-3-0	555,486	13,105,521-3-0
1758 . . . . .	12,773,187-2-0	173,080	12,946,267-2-0
1759 . . . . .	13,031,336-5-0	450,322	13,481,658-5-0
1760 . . . . .	11,975,346-4-0	465,702	12,441,048-4-0
1761 . . . . .	11,789,389-4-0	676,580	12,465,969-4-0
1762 . . . . .	10,118,689-1-0	495,036	10,118,689-1-0
1763 . . . . .	11,780,563-0-0	861,104	11,780,563-0-0
1764 . . . . .	9,796,522-0-0	553,406	10,349,928-0-0
1765 . . . . .	11,609,496-4-0	788,428	12,397,924-4-0
1766 . . . . .	11,223,986-7-6	524,312	11,609,496-7-6
1767 . . . . .	10,455,284-4-0	599,214	11,054,498-4-0

<sup>a</sup> Orozco y Berra, *loc. cit.*

<i>Year</i>	<i>Silver</i>	<i>Gold</i>	<i>Total</i>
1768 . . . . .	12,326,499-2-0	933,332	13,259,831-2-0
1769 . . . . .	11,985,422-2-0	497,770	12,483,197-2-0
1770 . . . . .	13,980,816-6-0	606,494	14,587,310-6-0
1771 . . . . .	12,852,166-3-0	501,266	13,353,432-3-0
<b>Total</b> . . . . .	<b>441,644,270-4-0</b>	<b>19,889,014</b>	

Subtract 15,058-7-6 pesos from the silver total for doubling and final sum of money coined

**Total** . . . 441,629,211-3-6 19,889,014

MONEY COINED, 1772-1821 <sup>a</sup>

<i>Year</i>	<i>Silver</i>	<i>Gold</i>	<i>Total</i>
1772 . . . . .	17,036,345-3-0	1,853,440	18,889,785-3-0
1773 . . . . .	19,005,007-2-0	1,232,318	20,237,325-2-0
1774 . . . . .	12,938,060-1-0	728,894	12,666,954-1-0
1775 . . . . .	14,298,093-4-0	734,100	15,032,193-4-0
1776 . . . . .	16,518,935-5-0	796,602	17,315,537-5-0
1777 . . . . .	20,705,591-7-6	819,214	21,524,805-7-6
1778 . . . . .	19,911,460-0-0	818,298	20,729,758-0-0
1779 . . . . .	18,759,841-2-0	675,616	19,435,457-2-0
1780 . . . . .	17,006,909-0-6	507,354	17,514,263-0-6
1781 . . . . .	19,710,334-6-6	625,508	20,335,842-6-6
1782 . . . . .	17,180,388-7-6	400,102	17,580,490-7-6
1783 . . . . .	23,105,799-1-0	610,808	23,716,607-1-0
1784 . . . . .	20,492,432-1-0	544,942	21,037,374-1-0
1785 . . . . .	18,002,956-7-0	572,252	18,575,208-7-0
1786 . . . . .	16,868,614-5-6	388,490	17,257,104-5-6
1787 . . . . .	15,505,324-7-6	605,616	16,110,940-7-6
1788 . . . . .	19,540,902-1-0	605,464	20,146,366-1-0
1789 . . . . .	20,594,875-6-0	535,036	21,129,911-6-0
1790 . . . . .	17,435,644-5-0	628,044	18,063,688-5-0
1791 . . . . .	20,140,937-0-0	980,776	21,121,713-0-0
1792 . . . . .	23,225,611-6-0	969,430	24,195,041-6-0
1793 . . . . .	23,428,680-3-0	884,262	24,312,942-3-0
1794 . . . . .	21,216,871-4-3	794,160	21,966,031-4-3

<sup>a</sup> Orozco y Berra, *loc. cit.*



<i>Year</i>	<i>Silver</i>	<i>Gold</i>	<i>Total</i>
1795 . . . . .	23,948,929-6-9	644,552	24,593,481-6-9
1796 . . . . .	24,346,833-0-6	1,297,794	25,644,627-0-6
1797 . . . . .	24,041,182-7-0	1,038,856	25,080,038-7-0
1798 . . . . .	23,004,981-2-3	999,608	24,004,589-2-3
1799 . . . . .	21,096,031-3-3	957,094	22,053,125-3-3
1800 . . . . .	17,898,510-7-0	787,164	18,685,674-7-0
1801 . . . . .	15,958,044-1-0	610,398	16,568,442-1-0
1802 . . . . .	17,959,477-3-3	839,122	18,798,599-3-3
1803 . . . . .	22,520,856-1-9	646,050	23,166,906-1-9
1804 . . . . .	26,130,971-0-3	959,030	27,090,001-0-3
1805 . . . . .	25,806,074-3-3	1,359,814	27,165,888-3-3
1806 . . . . .	23,383,672-6-0	1,352,348	24,736,020-6-0
1807 . . . . .	20,703,984-7-3	1,512,266	22,216,250-7-3
1808 . . . . .	20,502,433-7-3	1,182,516	21,684,949-7-3
1809 . . . . .	24,708,164-2-6	1,464,818	26,172,982-2-6
1810 . . . . .	17,950,684-3-6	1,095,504	19,046,188-3-6
1811 . . . . .	8,956,432-2-9	1,085,364	10,041,796-2-9
1812 . . . . .	4,027,620-0-9	381,646	4,409,266-0-9
1813 . . . . .	6,133,983-6-0		6,133,983-6-0
1814 . . . . .	6,902,081-4-6	618,069	7,520,550-4-6
1815 . . . . .	6,454,799-5-0	486,464	6,941,265-5-0
1816 . . . . .	8,315,616-0-3	960,393	9,276,009-0-3
1817 . . . . .	7,994,951-0-0	854,942	8,849,893-0-0
1818 . . . . .	10,852,367-7-6	533,921	11,386,288-7-6
1819 . . . . .	11,491,138-5-0	539,377	12,030,515-5-0
1820 . . . . .	9,897,078-1-0	509,076	10,406,154-1-0
1821 . . . . .	5,600,022-3-6	303,504	5,903,526-3-6
Total . . . . .	869,216,943-1-3	40,329,866	

MONEY COINED IN ALL THE MINTS OF MEXICO, 1822-1856 <sup>a</sup>

<i>Year</i>	<i>Total Money Coined</i>
1822 . . . . .	9,816,525-0-6
1823 . . . . .	9,785,024-3-6
1824 . . . . .	9,560,472-1-0

<sup>a</sup> Orozco y Berra, *loc. cit.*; the figures for this period include, besides silver and gold, a total of \$5,194,837-0-9 of copper coins.

<i>Year</i>	<i>Total Money Coined</i>
1825 .....	8,927,658-1-0
1826 .....	8,177,471-0-0
1827 .....	10,395,291-0-0
1828 .....	10,237,448-0-0
1829 .....	12,164,483-4-6
1830 .....	11,608,871-1-6
1831 .....	10,258,299-3-6
1832 .....	12,216,460-0-0
1833 .....	12,602,876-2-0
1834 .....	12,972,148-3-0
1835 .....	11,815,687-5-0
1836 .....	11,530,622-0-0
1837 .....	11,470,509-5-0
1838 .....	13,084,267-6-0
1839 .....	12,525,085-4-0
1840 .....	13,162,567-4-0
1841 .....	13,475,632-0-0
1842 .....	13,800,266-0-0
1843 .....	12,075,698-2-0
1844 .....	13,671,230-3-0
1845 .....	15,236,717-7-0
1846 .....	15,414,453-7-9
1847 .....	17,636,115-2-6
1848 .....	19,203,688-5-4
1849 .....	19,386,570-6-11
1850 .....	19,389,336-2-0
1851 .....	17,481,934-2-6
1852 .....	18,190,514-7-3
1853 .....	17,028,921-7-0
1854 .....	17,249,946-0-0
1855 .....	17,593,475-0-0
1856 .....	16,305,891-4-6

## APPENDIX B

### LIST OF EXPEDIENTES PENDING BEFORE THE TRIBUNAL DE MINERÍA JUNE 11, 1791

MINERIA, TOM. 49 ARCHIVO GENERAL

*Razon de los Expedientes y autos que hay pendientes  
y en curso en el Real Tribunal gral. del Ymportante  
Cuerpo dela Minería de esta N.E.*<sup>1</sup>

1. Expediente formado sobre liquidacion de avios ministrados a las Minas dela Compania de Pachuca de los fondos del Banco.
2. Expediente sobre que los Mineros avilitados de los fondos del Banco Ocurran al Rl. Tribl. a liquidar las Cuentas delos avios y a Otorgar las correspondientes fianzas para caucionar sus descubiertos.
3. Expediente a solicitud delos Mineros del nuevo Descubrimiento de Nochitlan jurisdiccion de Bolanos, sobre que se declare pertenecer los asuntos de aquella Minería a la Diputacion de Zacatecas por ser la mas inmediata.
4. Expediente a representacion de los Mineros del Cardonal sobre que se erija alli Diputacion.
5. Expediente de las Juntas generales que se habian de haber celebrado para la Eleccion delos Empleos vacantes en el Real Tribunal.
6. Expediente a solicitud de Dn. Marcelo Jose de Anza sobre que se le amplie el termino para el pago de 40 mil ps. que debe al Banco.
7. Expediente a solicitud de los Mineros de San Juan del Rio //dela Nueva Viscaya sobre que se establezca alli Diputacion.
8. Expediente sobre que a los Mineros del Real de la Yesca se les permita erigir Diputacion.

<sup>1</sup> A.G. *Minería*, vol. 49, expediente 1, ff. 149-157. This appendix is a literal transcription of the original ms. and no attempt has been made to edit it for spelling, accents, etc.

9. Expediente sobre cobro de pesos que debian Dn. Migl. Ruiz de la Mota y Consortes a Dn. Aniceto del Barrio quien cedio esta deuda a favor del Tribl. para reintegrarle de su descubierto.
10. Expediente sobre cobro de pesos contra la viuda de Dn. Carlos de Julves que tambien cedio al Tribl. Dn. Aniceto con el mismo fin.
11. Expediente sobre cobro de pesos contra la Testamentaria de Dn. Antonio Alvarez cedidos por dho. Barrio al Tribl.
12. Expediente sobre cobro de pesos que debian Dn. Antonio Fernanz. Rodriguez y Dn Santiago Gonzales al mismo Barrio.
13. Expediente sobre cobro de pesos contra Da. Guadalupe Alarcon viuda de Dn. Juan Basco, cedidos al Tribunal por dho. Basco.
14. Expediente del Sor. Dn. Simon de Mirafuentes Alvacea de Dn. Diego Baquedano sobre que continue el Tribl. los avios de las Minas de este, o se le permita venderlas, relevando al Comprador dela Paga del Descubierto de avios en favor del Banco.
15. Expediente sobre la venta dela Mina de Todos Santos hecha por Dn. Jose Molina sin aviso del Tribunal estando obligado a los avios que se le Ministraron.
16. Expediente sobre que se extinga la Diputacion de Guadalcazar en virtud dela Consulta en que representa la decadencia de aquel Real y falta de Mineros.
17. Expediente de Jose Garcia sobre que se le avilite por el Tribl. para ciertos experimentos de un modo nuevo de beneficiar. Ayudado por pobre.
18. Expediente delos Mineros del Real de Ntra. Sra. de Guadalupe, alias la Puerta en Sonora sobre erigirse en Diputacion.
19. Expediente en virtud de quexa delos Comisionados del Tribunal en Oaxaca contra Dn. Franco. Yniguez sobre negarles la Obediencia.
20. Expediente de Dn. Jose Antonio Montero sobre nuevo modo de beneficiar con ventajas y en corto tiempo los metales delas Minas privilegiadas dela Compania de Pachuca.
21. Expediente a pedimento del Fiscal del Cuerpo para identificar y comprobar un informe del S. Velazquez hecho al Exmo. Sor. Marqs. de Croix.

22. Expediente a representacion de Dn. Jose Negrete sobre impedir el Justicia de Xalapa a various Yndios de aquel Partido el Laborio de Minas.
23. Expediente a representacion de Don Juan Manuel Araujo Cura de Yhualapan en que noticia el descubrimiento de varias Vetas.
24. Expte. delas Herederas del Br. Montes con Dn. Pedro Berazueta sobre retension de ocho varas de Plata-Ayudads. pr. pobres.
25. Expte. a representacion delos Mineros del Rl. delos Catorce contra la Diputacion sobre el modo de proceder ala Eleccion.
26. Expte. a representacion delos Diputados de Tepantitlan sobre los // motivos porque no ha varificado la Eleccion.
27. Expte. a consulta de uno de los Diputados de Pachuca sobre no poder proceder ala Eleccion por hallarse ausente su Companero Dn. Jose Frontaura.
28. Expediente sobre el Tanteo y Corte de Caxa delos caudales del Banco de avios.
29. Expte. de Da. Maria Salome Ramos sobre Registro de una Veta en Jurisdiccion de Tescuco. Ayudada por pobre.
30. Exp. dela Veduria hecha en las Minas dela Compania de Pachuca. Se paso a S. Exa.
31. Expediente dela Eleccion dela (*sic*) Eleccion de Diputado y Substitutos de la Mineria de Tasco.
32. Expedte. dela Eleccion del Rl. del Fresnillo.
33. Expediente dela Eleccion del Parral.
34. Expediente dela Eleccion de Zimapan.
35. Expediente dela Eleccion de Ynguaran.
36. Expediente dela Eleccion de Zitaquaro.
37. Expediente dela Eleccion del Rl. de San Francisco Xavier.
38. Expediente dela Eleccion de Sombrerete.
39. Expediente dela Eleccion de Guanaxuato.
40. Expediente a consulta del Diputado de San Nicolas de Croix sobre no haber sugetos en quienes turnen las Elecciones.
41. Expediente sobre el arrendamiento dela Haza. del Pedregal que solicita Dn. Pedro de Ozta.
42. Expediente dela Eleccion de Charcas.

43. Expte. dela Eleccion de Guarizamey.
44. Expediente dela Eleccion de Sultepec.
45. Expediente dela Eleccion de Asientos de Ybarra.
46. Expediente dela Eleccion de Cosala.
47. Expediente dela Eleccion de Copala.
48. Expediente dela Eleccion de Zaqualpa.
49. Expediente dela Eleccion de Hostotipaquillo.
50. Expediente dela Eleccion de Diputados de Guichichila.
51. Expediente dela Eleccion de Dips. de San Luis Potosi.
52. Expediente dela Eleccion de Ojocaliente.
53. Expediente dela Eleccion de Cosihuiachi.
54. Expediente dela Eleccion de Tlalpuxahua.
55. Expediente dela Eleccion de Temascaltepec.
56. Expediente dela Eleccion de Alvadeliste.
57. Expediente dela Eleccion de Bolanos.
58. Expediente dela Eleccion de Zacatecas.
59. Expediente dela Eleccion de Alamos.
60. Expediente dela Eleccion de Batopilas. Todos hasta aqui de Oficio.
61. Expediente a instancia del Capitan Dn. Esteban Gonzales de Cosio contra Dn. Juan Domingo Perez de Tagle sobre ps.
62. Expediente sobre el Denuncio hecho por el Sor. Marques de Rivascacho dela Mina de San Diego en Temascaltepec.
63. Expediente sobre el denuncio de una Haza. de Fundicion en el Real de Atotonilco el Chico, hecho por Dn. Ygnacio Mollada.
64. Expediente a instancia del Sor. Coronel Dn. Juan Franco. Echarri contra su Sirviente Franco. Leiba sobre venta que hizo clandestinamente de varias Metas.
65. Expediente sobre solicitud que hazen de nuevos avios los duenos. dela Companja de Pachuca. Se paso a S. Exa.
66. Expediente sobre el denuncio de una Mina de Cobre a pedimento de Dn. Julian Pinedo contra el S. Coronel Dn. Juan Franco Echarri.
67. Expediente sobre el denuncio delas Minas de Mellado hecho por el Capitan Dn. Franco. Septiem.

68. Expediente de Dn. Manuel Ensiso contra los herederos de Dn. Joaquin dela Pena sobre el denunció dela Mina Candelaria Bvicada en Temascaltepec.
69. Expediente sobre cuentas que solicita Dn. Jose Maria Molina de Dn. Manl. Herrera por razon dela Compania que tubieron en la Mina Todos Santos del Real del Monte.
70. Expediente del Br. Dn. Jose Gil Barragan sobre nuevo Ymvento de beneficio.
71. Expediente sobre Ynvento de beneficio por el Thente. Dn. Juan Manuel de Otal.
72. Expediente de Jose Tiburcio Rodrigz. y Dn. Jose Mariano Samper sobre denunció dela Mina San Juan Baptista en el Rl. de Tlauzingo.
73. Expediente del Lic. Dn. Jose Gares sobre que se haga vso del nuevo fundente del Tequesquite, y se le conceda el privilegio exclusivo con arreglo a las Ordenanzas.
74. Expediente del Br. Dn. Antonio Garcia Orabuena sobre que en el Real de Zimapan se establezca el beneficio de Azogue como mas vtil a los Mineros y de que no vsan por error.
75. Expediente sobre prestamo de 6 mil ps. hecho delos Fondos del Banco a los duenos dela Compania de Pachuca.
76. Expediente de Jose Maria Sanches Luque vecino de Huahutla contra Juana Origuela sobre propiedad de media Mina en la de Animas.
77. Expediente de Dn. Thomas Perez de Abrego y Dn. Manuel de Ordiera sobre pesos.
78. Expediente del Capitan Dn. Franco. Gutierrez de Teran contra el Capn. Dn. Diego Villasante sobre propiedad dela Mina descubridora nombrada la Sma. Trinidad en el nuevo descubrimiento del Oro.
79. Expediente de Dn. Juan Baptista Echarri contra el Cura de San Juan Chicomexuchil sobre que conforme a cierto contrato se restituyan a su Haza. 160 y tantos marcos de plata.
80. Expediente de Dn. Luis Sanchez de Velasco quexandose dela Diputacion del Catorce sobre agravios en el conocimiento de los autos que alli sigue sobre propiedad dela Mina Guadalu-pito.

81. Expediente de Dn. Jose Gregorio Alcay y Dn. Antonio Maldonado contra el Regidor Dn. Jose Gomez Campos sobre nulidad de cierto contrato.
82. Expediente de Dn. Manuel Fernandez de Cordoba sobre Ynvento de beneficio.
83. Expediente a instancia de Don Jose Morales contra Dn. Gabriel Ordiales sobre pesos.
84. Expediente de Dn. Jose Gutierrez y Dn. Franco. Lopes dela Pena // sobre registro de una Veta que nombran Ntra. Sra. dela Consolacion en Yxtepegi.
85. Expediente de Dn. Jose Gutierrez y Dn. Franco. Lopes sobre Registro de la Veta que llaman San Gregorio Macianceno en la misma Jurisdicción.
86. Expediente de Registro que hizo el Lic. Dn. Juan Junquera de dos vetas en Jurisdiccion de Guajuapa; la una con el nombre de San Dimas, y la otra con el de Sra. Sta. Anna.
87. El Expte. de este Numero esta ya concluido.
88. Expediente de Dn. Pedro Rodriguez sobre nuevo Ynvento de beneficio que ha proyectado.
89. Expediente de Registro de Dn. Miguel Ybarra de una veta en el Pueblo de San Sebastian jurisdiccion de Nochitlan.
90. Otro expediente de Dn. Miguel Ybarra de otra veta que registro en dho; Pueblo de San Sebastian.
91. Expediente de Registro de Dn. Juan Basques de una veta en tierras del Pueblo de Xaltepeque de Nochitlan.
92. Expediente de Registro de Dn. Juan Bonegui de una veta en el Pueblo de Penoles de Nochitlan.
93. Expediente de Dn. Jose Vicente Gonzales Guerra contra Dn. Juan Antonio Flores sobre pesos.
94. Expediente de Francisco Valenzuela y Consortes so// bre registro de una veta de Plata nombrada Ntra. Sra. de Guadalupe en Tescuco.
95. Expediente sobre registro de quatro pertenencias a continuacion dela Mina de Dn. Felis Viton nombrada la Soledad hecho por el Coronel Dn. Juan Francisco Echarri y su hermo. el Capitan Dn. Juan Felipe.



96. Expediente sobre registro de una veta con el nombre de Ntra. Sra. del Rosario en Jurisdiccion del Real del Monte hecho por Dn. Jose dela Serna y Jose Anastasio Viveros.
97. Expediente de Dn. Pedro Pacheco sobre denuncia del Socabon y Mina Santa Rita en el Real de Huahutla.
98. Expediente sobre denuncia hecho por el Sor. Coronel Echarri de un Sitio y Aguas para Haza. de beneficio en el Paraje llamado Razabeguti.
99. El expediente de este numero se concluro por tranzacion.
100. Expediente a instancia del Br. Dn. Thomas de Torres sobre invento de una Arrastra para beneficiar los Relabes o Xales: y demanda de pesos contra Dn. Jose Luis Fagoaga. En Alzadas.
101. Expediente de Da. Maria Josefa Casal sobre denuncia dela Mina Senor San Jose en Huahutla.
102. Expediente de Dn. Francisco Sastre y Dn. Gregorio Enquidanos sobre pesos.
103. Expediente de Dn. Manuel Benabides y Dn. Marian Flores sobre Registro de quatro pertenencias en el Zerro Nu-// cuando jurisdiccion de Nochitlan.
104. Expediente de Dn. Lorenzo Guardamino contra Dn. Juan Antonio Flores sobre pesos.
105. Expediente del Lic. Dn. Manuel Romo con Dn. Manl. Arguero sobre pesos.
106. Expediente de Registro de una Cata en la Veta nombrada la Plomosa en el Real de Huahutla hecho por Dn. Juan Jose Apesechea.
107. Expediente del Br. Dn. Jose Sahcnez Espinoza con Dn. Jose Joaquin de Otero sobre cuentas.
108. Expediente del Capitan Dn. Jose Frontaura y el Br. Dn. Jose Sahcnez Espinoza sobre disolucion dela Compania que tenian en las Minas del primero.
109. Expediente del Capitan Dn. Jose Frontaura, Dn. Manl. Herrera y el Br. Espinoza sobre que le continuen los avios de sus Minas o se le declare expedito para solicitarlos de otros Sugetos.
110. Expediente del Theniente Coronel Dn. Franco. Sonanes con Dn. Benito Arines sobre cumplimiento dela 8a. Condicion dela Escritura de Compania. En Alzadas.

111. Expediente del Licdo. Don Manuel Romo con Dn. Jose Mariano Mimiaga y Dn. Miguel Olascoaga sobre propiedad dela Mina Santa Rita en Pachuca.
112. Expediente de Dn. Juan Domingo Perez de Tagle contra Dn. Pedro Bustamante sobre que le continue los avios. // de sus Minas o se le declare en libertad de buscar aviador.
113. Expediente de Da. Maria Ysavel Munguia vecina de Chiranganguero sobre propiedad de una Mina cobriza con Dn. Ysidro Calvo y Gregorio Hernandez.
114. Expediente sobre el concurso de acredores a cantidad de pesos procedida dela Venta delas Minas de Capula que quedaron por bienes de Dn. Jose azo y Otal.
115. Expediente del S.D. Pedro Alles y Dn. Joaquin Colla contra Da. Margarita Albornoz sobre nulidad de cierta cesion en la Mina Lechuzas.
116. Expediente del Sor. Coronel; digo: Conde de Xala contra los duenos de la Compania de Pachuca sobre pesos.
117. Expediente del Dr. Dn. Manuel Marcos de Ebarra contra Dn. Miguel Munoz sobre nulidad dela Venta de seis barras que en la Mina Preciosa Sangre hizo Dn. Franco Bataller.
118. Expediente de Registro de quatro pertenencias de Cobalto hecho por el Capitan Dn. Jose Frontaura.
119. Expediente de oposicion al Registro hecho dela Mina San Esteban en el Real de Huahutla entre Dn. Francisco Valcarze y Augustin Roman.
120. Expediente de denuncia de tres Minas en Alvadelite hecho por Dn. Juan de Onzalo.
121. Expediente de Dn. Jose Mariano Gallegos sobre denuncia dela Mina Santa Gertrudis en Huahutla.
122. Expediente de Dn. Jose Manuel Miranda contra Dn. Anto. Ybarra // sobre denuncia dela Mina descubridora en la Vega de Tepalcingo.
123. Expediente de Dn. Fermin Raigadas sobre invento de Mortero.
124. Expediente de Dn. Jose Luis de Fagoaga con Dn. Jose Mariano Samper sobre compania en la Mina de Santiago. En Alzadas.
125. Expediente de Dn. Feliz Vergara contra Dn. Jose Chafino sobre pesos.

126. Expediente de Dn. Jose Mariano Main sobre registro de una Veta en el Pueblo de Naulingo Jurisdicn. de Xalapa.
127. Expediente de Dn. Juan Lopes Saavedra con Dn. Santiago Gaitan sobre cobro de pesos.
128. Expediente sobre invento de Mortero por Dn. Migl. Daraz de la Rosa.
129. Expediente de Dn. Jose Carlos Regueijero contra Don Jose Ferron sobre nulidad de una obligacion que le otorgo para el pago de pesos.
130. Expediente de Dn. Antonio Sanches vecino de Huichiapa sobre registro de una veta de Semialabastro.
131. Expediente de denuncia general del Senor Marques del Apartado, y su hermano Dn. Juan Baptista Fagoaga, y solicitud sobre privilegio de quintos.
132. Expediente de Dn. Francisco Guerrero y Torres contra Dn. Pedro Pacheco sobre extravio de los avios que le ha ministrado.
133. Expediente de denuncia general de quatro Cerros en el Pueblo de Naulingo Jurisdiccion de Xalapa, hecho por Dn. Franco. Paula Gomez y Dn. Gregorio Texada y San Roman vecinos del Comercio de Veracruz.
134. Expediente sobre registro de una Veta en Jurisdiccion de Cuernabaca hecho por Dn. Jose Vasques del Camp, y Luis Partida.
135. Expediente de Denuncio dela Mina Preciosa Sangre en Huahutla hecho por Da. Maria Tiseira.
136. Expediente de denuncia dela Mina Ntra. Sra. del Rosario en Jurisdiccion del Actopan por Don Manuel Suamonte.
137. Expediente de denuncia dela Mina Centeno en Jurisdiccion de Cuyuacan por Dn. Martin de sn Juan Barroeta.
138. Expediente sobre prorroga de seis meses de termino pedido por el Capitan Dn. Diego Villasante para practicar las diligencias del denuncia dela Mina la Hedionda en Jurisdiccion de Villalta.
139. Expediente de Dn. Jose Reyes sobre denuncia de una Mina nombrada Candelaria en el Pueblo de Naulingo en Xalapa.
140. Expediente en que Dn. Jose Reyes revalida el Registro dela Veta nombrada San Jose en Naulingo de Xalapa.
141. Expediente de Registro de Dn. Jose Alexandro Serrano y Don Antonio Roldan de una veta para vidrio en el Zerro de Te-

peyac. Expediente entre los duenos dela Compania de Pachuca con // aquellos Diputados y el Comisionade para la veduria que se formo sobre pago de las costas de ella. Es incidente del N.30.

142. Expediente de Dn. Juan Jose de Apesechea y Consortes de una Veta en el Zerro del Cacalote Jurisdiccion de Cuernavaca.
143. Expediente del Senor Fiscal Don Juan Eugenio Santelizes reiterando el denuncia de sus quatro Minas en el Real de Tetepango Jurisdiccion del Real del Monte.
144. Expediente de Dn. Jose Antonio Montero sobre denuncia de la Mina Expejeras en Pachuca.
145. Expediente de Dn. Miguel Daras dela Rosa sobre denuncia de la Mina Grande en Pachuca.
146. Expediente de Dn. Miguel Daras dela Rosa sobre denuncia de la Mina Navarro en Pachuca.
147. Expediente del mismo Daras y Dn. Jose Luis Escorsia, denunciando la Mina Sta Gertrudis en Pachuca.
148. Expediente de Dn. Jose Alonso Romero solicitando se le nombre por Escribano de Minería para Oaxaca.
149. Expediente de Dn. Juan Martin de Herpino con Dn. Franco. Rodriguez Bazo sobre pesos.
150. Expediente de Dn. Francisco Barbero contra bienes que quedaron por fallecimiento de Dn. Domingo Busturia sobre pesos. En Alzadas.
151. Expediente a instancia del Capitan Dn. Augn. Llamosa // contra la Cassa del Senor Conde de Ravago sobre pesos.
152. Expediente que siguen Dn. Ancelmo Montero y Dn. Jose Valcarce sobre el denuncia de la Mina y Socabon de Moran En Alzadas.
153. Expediente de Concurso de Acredores de Don Aniceto del Barrio En Alzadas.
154. Expediente de Arines con Don Augustin de Bria sobre cuentas En Alzadas.
155. Expediente de Dn. Juan Martin de Yarza contra Dn. Felis Viton sobre la entrega de porcion de metales que este extraxo de la Mina de aquel. En Alzadas.

156. Expediente del Senor Coronel Dn. Juan Franco. Echarri con Dn. Francisco Yniguez sobre propiedad de la Mina Aurora. En Alzadas.
157. Expediente sobre pesos que debia Dn. Martin Lopes Torresilla a Dn. Aniceto del Barrio Ayudado pr. pobre. En Alzadas.
158. Expediente de Oficio que ha seguido Dn. Luis Antonio Emazavel contra Dn. Joaquin Eguia sobre premio de platas.
159. Expediente de parte sobre el denuncia que hizo la de Dn. Manuel Arevalo y Carreno dela Mina nombrada la Sma. Trinidad en el Paraje nombrado Yucundo del Pueblo de Huitepeque.
160. Expediente de Dn. Pedro Nicolas y Dn. Jose Franco Morales sobre denuncia dela Mina nombrada Ntra. Sra. dela Consolacion en terminos del Pueblo de Yxtlan Valle de // Oaxaca.
161. Expediente a solicitud del Secretario de este Tribunal sobre que se declare si debe llevar derechos por varias actuaciones que resultan en el Tribunal de Alzadas y que antes no habia necesidad de impender.
162. Expediente de avios, de Dn. Juan Jose Carrillo y Vertiz para su Mina del Rosario.
163. Expediente a Solicitud del Teniente Coronel y Consultor Dn. Silvestre Lopes Portillo sobre avios del Banco para sus Minas.
164. Expediente contra Dn. Felis Vergara sobre que pague al Banco los peltrechos que tomo de la Haza. de Enmedio. De oficio.
165. Expediente del Capitan Don Diego de Villasante sobre denuncia de la Mina Plomosa en Jurisdiccion de Hustepeque.
166. Expediente formado a pedimento del Sor. Fiscal del Cuerpo de Minería sobre el modo de colectar y remitir las cantidades de pesos que resultan de los granos de plata que exigen los Ministros de Real Haza. de Zacatecas, Potosi y Pachuca. en las de Rescate.
167. Expediente sobre que se dispusiesen los Hornos de Chapultepec para ciertos ensayos que se hizieron. Se paso a S.E.
168. Expediente a instancia de Dn. Leon Rezabal y Dn. Jose // Manuel Castorena contra el Thente. Coronel Dn. Franco. Sonanes sobre restitution dela Cata nombrada Espiritu Santo de que les despojo su Apoderado. En Alzadas.
169. Expediente del The. Coronel Dn. Franco. Sonanes y Dn. Benito Arines sobre transacion y liquidacion de Cuentas. En Alzadas.

170. Expediente entre Dn. Manuel David y Dn. Manuel Ortis vecinos de Temascaltepec sobre denuncia de una Cata. En Alzadas.
171. Expediente de Da. Anna Paula y Da. Marianna Nunes vecinas de Oaxaca con el Sor. Coronel Echarri sobre propiedad de las Minas Jesus Maria y Santa Gertrudis.
172. Expediente delas Cuentas dela Administracion delas Minas de agua el Jarro y Paula. De oficio.
173. Expediente de avios ministrados del Banco a Dn. Jose Panagua en que se trata del arrendamiento de la Hazienda de Jesus Nazareno.
174. Expediente de Dn. Jose Frontaura denunciando de nuevo su Mina del Rosario en Pachuca. De parte.
175. Expediente de Dn. Jose Frontaura sobre denuncia de la Mina del Rincon en el mismo Real.
176. Expediente de Dn. Jose Frontaura sobre la Mina de San Marcial en Atotonilco.
177. Expediente sobre cobro de 300 ps. de que resulta deudor al Banco Dn. Jose Sixto Gonzales por el tiempo que fue Ynterventor de la Negociacion Paula y Xarro.
178. Expediente de Dn. Luis Zopeda Torresillas vecino de Guanajuato quexandose de aquella Diputacion y su Escribano por varios procedimientos.
179. Expediente de Jose Bernardino Ocampo y Companero sobre Registro de una Veta Virgen en Jurisdiccion de Cuernavaca.
180. Expediente sobre el establecimiento del Colegio Metalico.
181. Expediente a pedimento del Sor. Fiscal del Cuerpo de Minería sobre que Dn. Maria Josefa Gasal y Alvarado haga cietta declaracion.
182. Expediente de Eleccion de Diputados y Substitutos dela Minería de Sombrerete.

Mexico y Junio 11 de 1791

ra

Mariano Buenav.  
de Arroyo (Rubrica)

## APPENDIX C

### FAUSTO DE ELHUYAR REFLECTIONS ON THE WORKING OF THE MINES AND REFINING OPERATIONS IN THE REAL DE GUANAXUATO, 1789<sup>1</sup>

#### GENERAL CONSIDERATIONS

THE CITY or Real of Guanaxuato is situated in the bottom of a valley, or rather of a basin, whose sides form fairly high mountains divided by a multitude of gorges, in which there are found scattered both the major part of the settlement and all the mills in which are refined the minerals, which are very numerous. Of all these mountains none could be said to be entirely sterile of minerals, but those of the northern tier have always shown more abundance and richness than the rest; for which reason the miners have always given to it their principal attention, have explored it with greater endeavor, and have tenaciously expended on them their solicitude, industry, and capital, occupying themselves very little with the others in which at the present time there is not a mine which merits any attention.

In these mountains there occur different veins, but that which they call "Madre" is the one which at all times has been considered as the principal one; in none of the others have the works been followed as extensively as in this one, both along its bearing and its dip, nor are there any formal workings in any of these others at the present time, for which reason they do not require any special consideration. Consequently, all that we are going to say will refer to the "Veta Madre," which compensates for the other areas by combining all the favorable circumstances for which a miner might ask in order to satisfy his desire with little work (in comparison with the many and serious obstacles which he generally has to overcome in other regions), and on which there are found scattered at various distances from each other the principal mines of that Real.

This vein runs from southeast to northwest along the southern slope of the said mountains of the northern tier and has like them

<sup>1</sup> The original of this document is in *A.J.*, Sec. 5, *Aud. de Méx.*, Leg. 2241. In this translation I have attempted to follow rather closely the author's language, and have rendered technical mining terms into their nearest equivalent English mining terms.

a strike toward the southwest of some forty-five degrees, inclination. Its thickness is immense as it occupies sixty varas and in parts they affirm that it is up to eighty. Its ore is abundantly rich and does not fail to maintain reasonable uniformity. The rock, and even the body of the vein itself, are firm enough so as not to require other props or equipment than the pillars which are left at intervals to protect the workings. The water which accumulates from these workings is so little that in no mine does it require a continuous machine to extract it, unless it has accumulated by some accident, as is the case at the present time with most of them, since their deepest workings are flooded as a result of the sickness, mortality, dearth, and scarcity of supplies, which these regions have experienced during the last few years.

The only thing which by nature is lacking in this Real is surface water both for running the machines and for the refining operations, since even for these it is necessary to draw the water from wells by means of pumps. Another defect in this Real which is due to carelessness and can be remedied is the fact that these mountains and those which adjoin them for many leagues are bare of trees, which has caused a scarcity of wood and makes its transport very expensive both for fuel and for the supports, machines, and other articles which must be constructed. Finally, these factors, added to the high price of other materials, wages, and supplies which apply in this Real, make unprofitable a large quantity of low-grade ore which under other conditions would show some return.

Notwithstanding this, the first circumstances are so favorable that, overcoming all these drawbacks, they make of Guanaxuato at the present time the richest and most opulent mineral district of the kingdom; since, in spite of the fact that a large number of its principal mines are flooded and producing very little because they have not been drained nor their levels cleaned out, there should be credited to this Real four millions of the twenty which has been coined this year in the royal mint of this capital — which figure is not approached by any of the other Reales.

Passing from these general considerations whose defects cannot be remedied by our skill to the matters in which it may have some immediate influence, we will run over lightly one by one the different branches which compose the technique of mining, giving a general idea of the state in which I consider them to be, and in which of them, on the strength of what I have seen to date, I judge there is room for some improvement.



CONCERNING THE GENERAL DISPOSITION OF THE WORKINGS<sup>2</sup>

The exploitation of mines in accordance with a general plan which embraces in all its phases and knits closely together the different operations and tasks which are the means by which the object is obtained facilitates its success to a very great extent, removing obstacles, preventing embarrassment, and spreading over all the steps good order and great economy. In effect, a systematic relation between all the workings, a regularity in their distribution, and certain fixed rules in the practice of their construction reveal the good or bad qualities of a vein in a long section of its direction and inclination and allow a clearing away of obstacles and freedom of movement: the worker engages in any of the operations with ease and without any other inconvenience than the difficulty of the task itself, as a result of which he can extract the ore with greater ease and without any particular harm to his strength or his health: the transport of the ore, its removal from the mine, the disposal of the water, and the ventilation are in themselves aided exceedingly by this orderly arrangement, from which there results so great an economy that one can affirm that without it the greater part of the mines of Germany and Hungary which at the present time give some return would be entirely unprofitable. The proper division, relation, and uniformity of the workings likewise contributes to their security and stability, since by this means it is possible to make much more simple the leaving of pillars for props and even avoid a considerable number of those, which in view of the method followed up to the present in the works in this country, the Ordinances require so properly should be left at regular intervals even in good rock.

All these advantages are the result of good order, and most of them are yet to be experienced in Guanaxuato because of its lack. The miners of this Real do not extend their vision beyond the day in which they live. With the vein in hand, they follow it faithfully wherever it seems best to them. If, after having followed it for a space horizontally the best ore turns off toward one side, they twist the excavation toward it; if downward, they follow it deeper; if from there it turns its course upwards, they lay out a stope which they call "de cielo." There results from this a combination of workings which is serpentine, irregular, and without any connection or

<sup>2</sup> "Workings" is used as a collective term for all the drifts, stopes, raises, and other excavations used for extracting the ore.

uniform relation within itself. For this reason the ventilation is greatly interrupted, the transport and removal of the ore is made much more difficult and expensive, the drawing out of the water when it occurs in abundance is made hard and occasions excessive expenses, and finally the supports and masonry which sustain the weak spots of the hanging walls and ceilings are made much more complicated, difficult, and less secure. From the details that follow, these bad results will become more evident; but before taking them up I should observe that the Germans sent to Zacatecas and Taxco, in the reports which they have sent me to date, complain equally of the disorder and irregularity of the workings of such mines as they have examined; for which reason it would seem that this defect is not peculiar to Guanaxuato but is common, if not in all, at least in many of the mining camps of the kingdom.

This fault, which I consider as the most outstanding of such as I have been able to examine up to the present, since from it spring almost all of those which present themselves in the operations of these mines, will be the most difficult to root out; and, in consequence, its remedy will be one of the last which we will be able to attain. In the mines which are already in actual operation and which have fairly extensive workings, this system will be rather difficult to apply, at least with all that symmetry and niceness which is demanded by a perfect plan; but by doing at least what is possible in these, and by seeing that in other new ones and where the operations are less advanced the workings are established with proper regularity, it will be possible to develop some models or examples, in imitation of which others will be developed in order; so that these dispositions will successively become more general, from which very considerable advantages are bound to result to the miners themselves, to the royal treasury, and to the state in general.

#### CONCERNING THE MINING OF THE ORE AND THE TIMBERING OF THE WORKINGS

The mining of the ore is practiced by the same method as in Europe, but alike in the construction of the implements as in the method of applying them and the effects which they produce there does not fail to be some difference which indicates that certain useful improvements should be made on these points. In this connection it would be very valuable to make some comparative tests through

the medium of the German miners, they working by their methods in competition with others of this country who should work in their accustomed way, the other conditions being as far as possible uniform. There should result from these improvements some saving in cost and some advantage in the quantity of material that could be extracted in a given time, but I do not consider this is a factor which could have a great influence on the advance of the mining industry of this kingdom to which I am now directing my observation.

As far as the supports are concerned we have already said that inasmuch as both the vein itself and the rock of the walls are very strong they need and use very little timber in this Real and the pillars of the vein itself which they leave at intervals generally suffice. There are, however, very few mines here where they have complied fully with the prudent rules which the Ordinance prescribes, because there is not careful enough inspection or proper enforcement. Nevertheless there are masonry works and timbering in some short stretches of the drifts or galleries, and even in various shafts. From what I have seen, both in these and in some mines with weak veins at a little distance from Guanaxuato, I did not fail to think of that art and the principles of mechanics and architecture which are followed in Germany in this operation in order to give to the structures a connection and solidity in proportion to the load which they must bear and the time which they must last. Not only are the timbers weakened by cutting them improperly, but the fact is also that they are not placed in that position which they should have in order to give the maximum resistance to the thrust of the walls; one observes in the aggregate a great irregularity both in the laying out of each side of the level which is timbered as well as in the line of timbers themselves. Some of these project farther into the interior than others, with the result that in the shafts for the removal of the ore there is a continual rubbing of the ropes, sacks, and buckets with which the water and ore are extracted, which at times causes the latter to catch on these projections. This delays their withdrawal by making it necessary to unhook them, or if they disentangle themselves it causes a great resistance and a violent jar to the machinery and to the horses which move it, which cannot fail to be harmful to both. These defects, whose partial remedy is clear and simple for anyone who notices them, even if he does not have any special knowledge of the subject, are evidence not only of the lack of skill of those who superintend and carry out these works, but also, and perhaps more essentially, of a certain indolence or lack of curiosity with which they do the work. They content themselves with

doing it roughly, without deeming of the least consequence the inconveniences and embarrassments which result from these omissions. In truth what neatness or what orderliness can one expect, either from the workers who are employed on these tasks, or from the foreman who superintends and directs them? He likewise has been nothing more than a simple workman without any other instruction beyond which he has seen others do, without knowing how or wishing to read, and usually considering himself a person of importance whose pride and self-esteem do not allow him to accept advice from anyone, and whose employer, even, does not dare to make the least correction in what he does. With this kind of supervision such defects are very natural and unavoidable.

One concludes from this then that some progress can be made in this field which will result in benefits to the economy of the mine-owners themselves, in the safety of the lives of the workers, and in making possible a longer life for the mines; but in order to accomplish this it is necessary to overcome a thousand obstacles raised by ignorance and prejudice, and only with time, consistency, and determination on the part of some of the owners will it be possible to attain, little by little, those processes of reason which in themselves commonly have little influence on these people, and since trials and experiments are very expensive, lengthy, and difficult to practice in this field.

#### CONCERNING THE REMOVAL OF THE ORE AND THE EXTRACTION OF THE WATER

The removal of the ore is made in general by means of vertical holes, called shafts, which are dropped outside the vein at some distance from its beginning or outcropping, and which, after traversing the country rock, communicate at a greater or less depth with the vein and one of the cuts made in it. This type of shaft, the reason for which lies in the great inclination of the vein, although very costly in its depth, occasions great economy in the removal of the ore, and thus in enterprises in which they can overcome the initial cost they are very useful. In Europe this advantage is generally lacking, and thus although the great utility of this type of working is already known it is little used; but they do not fail to have one of another nature, and if one considers all the conditions which occur there compared with those of this country one will see various particulars which are lacking here or which are different from the European ones.

In Europe these shafts are not limited to one single communication with the workings of the mine, that is at the depth which it cuts the

vein, but rather the fact is that at different levels both above and below this point they establish drifts or crosscuts from the vein to the shaft, cut out of the country rock at this level: with the result that by means of these drifts the haulage to the various stations of the shaft is made horizontally without having to go either up or down. In Guanaxuato, on the contrary, they do not construct these crosscuts, and thus the shaft communicates only with those workings which are on the same level as the point at which it crosses the vein; consequently, the ore and the water from the lower workings has to be raised to this point and that from the upper workings has to be lowered in some way to the station of the shaft, whence it can be raised to the outside; and one can easily see the difference which there must be between the haulage in the first case where it is horizontal and there is never any increase in the depth from which the materials must be extracted, and that which results in the second case, where in addition to extending the removal of ore from the levels above the station, it is made very difficult by so much raising and lowering, especially as this is handled in Guanaxuato, as will be shown below. It is true that such drifts or crosscuts are costly works, but, as they are founded on the same principles which in this type of vein make vertical shafts preferable to inclined ones constructed in the vein itself, one realizes in the same proportions from these crosscuts the same advantages which result from this type of shaft; from this one can conclude that the vertical shafts are not turned to as much advantage in Guanaxuato as they might be.

These shafts are excessively expensive in Guanaxuato because they are constructed of such great size. This is necessary, first, because of the number of machines that are placed in each one, since there are four, six, or even eight hoists; and second, because the ore is hoisted in leather sacks which are suspended from ropes and travel loose without the least control, swinging from side to side both in going up and going down; because of which if there was not sufficient space the ropes would be continually striking against each other and becoming tangled. If instead of these sacks they employed, as they do in Saxony, wooden boxes which should be raised and lowered between two timbers equipped with little wheels to diminish the friction, the result would be in the first place that the shafts would not have to have any greater size than that demanded by the actual space which these boxes and the guiding timbers occupy, which necessarily would be less than that required for the sacks; in the second place, since these boxes could be made of a well-proportioned size, it would be

possible to load them with double the amount of ore which the sacks raise at present, and consequently under the same circumstances the same amount of work could be done as at present with half the number of machines and the shafts would only have to have half the size which they have had in the past; at the same time a considerable saving in hides would be accomplished, whose value would surely cover the cost of the said boxes and of the timbers necessary to guide them.

If I am not mistaken, this suggestion may be one of the most useful for this region, but it probably will not be the first which it will be persuaded to adopt, both because every novelty inspires a certain amount of fear and because the original installation of this system cannot fail to be rather expensive, since, for a deep shaft, a considerable amount of lumber will be necessary.

The machines which they use for raising the ore through these shafts are whims moved by horses. In their design they are not very different in general from those that are used in Europe, but they are constructed with less solidity and not with the best relationship between their various parts; for which reason there is room for some improvement; and this is about the only thing that can be done in Guanaxuato on this phase. In other mining centers where there is more water than in Guanaxuato there might be introduced, in place of these machines, hoists worked by water power with which they do not appear to be familiar here, and which would surely result in considerable economies for the miners who are able to take advantage of them.

As far as the extraction of water is concerned we have already said it is of little importance in those mines in Guanaxuato which are in good producing condition, although at the present time it is of much importance since the levels of the majority of them are flooded for reasons that have already been expressed. This extraction is practiced in the same way as the removal of the ore, by means of the whims driven by horses raising the water up the shafts; there is no drainage adit nor are any of the other machines which are in use in Europe employed here. Nevertheless, the lay of the land is such as to be very favorable for the construction of a general adit which could serve most of the mines; but it would be very difficult, not to say impossible, to get all the people who would be benefited by such a work to agree to bear the expense, since it would be beyond the resources of any one individual. As far as the other machines which are in use in Europe are concerned, there they are very much more useful and advantageous than the whims, but I would not venture to say that they

would be equally so in this country. By their very nature they are much more expensive and complicated than the whims; they require able artisans and materials which are not present here in such abundance or at such reasonable prices, and likewise their operation is rather difficult, and the limited knowledge of this country which I have been able to acquire up to the present is not sufficient for me to decide whether or not they would be practicable. For this reason we must content ourselves for the present with trying to bring about the same advantages in the extraction of the water by whims which we have said can be applied to the removal of the ore, since in the manner in which they are carried out at the present time, these two tasks are in reality one.

#### CONCERNING THE UNDERGROUND TRANSPORT OF THE ORE AND WATER

For a consideration of the operations in their proper order, before speaking of the removal of the ore and water through the shafts, we should have dealt with the transport of these substances from the spot where the ore is being mined to the stations of the shafts, but we have reserved our treatment of this subject on purpose, knowing that in this way it would be easier to understand what we have to say concerning it.

The operation of underground transport is the worst organized, the most tiring, the most harmful to the workers, and at the same time the most burdensome for the owners of the mine of all those that are carried on at Guanaxuato. The lack of communications at various levels between the shafts and the workings of the vein by means of crosscuts of which we have spoken in the second section makes it impossible to carry out the haulage operations with that dispatch, ease, and economy to which they are susceptible, since with these crosscuts it is possible to transport the ore in little cars right from the level itself to the shaft without any circumlocution, with great speed, a considerable saving on the number of laborers, and without great fatigue on their part; instead of which, because of the defects, it is necessary that the ore which is gathered in the levels above the only station which each shaft has, which is at the point where it joins the vein, is lowered to it, thus adding this trip to the other equal one which it has to make in being extracted through the shaft to the outside; and also the ore from the levels below the said station has to be raised to it by means which never can be as economical as if it were done by large machines such as a whim.

Nevertheless, one could excuse this if these raisings and lowerings were made by some simple means such as cutting winzes from the upper levels to the level of the station, through which all the ore could be dumped and carried thence to the station of the shaft; and, likewise the ore from the lower levels could be raised to the level of the station by means of similar raises and with simple winches operated by two men, or if it were possible and convenient by a small subterranean hoist, which could surely be done as it is in other places with very small expense and little labor. But nothing of this is done, nor does the irregularity of the workings permit the use of the little carts of which we have spoken even for the shortest distances; but instead the ore or water is raised or lowered from the rock-face where the former is being mined, on the shoulders of hundreds of workers and boys, each loaded with six or eight "arrobas," who have to make a certain number of trips during the hours that their shift lasts according to the distances, with the result that they suffer a fatigue which wastes them away and kills them and the owner incurs an expense of at least half a peso a day for each one.

The result of this is that the heaviest charges which appear on the weekly payroll are generally those of the "Tenateros," as those who are occupied in these tasks are called; but its remedy is easy, and there should not be much opposition to its adoption because its value and the effects which it is bound to produce manifest themselves to the whole world with too much clarity and present too great advantages for those who are affected not to adopt that which is of such importance to them in this connection.

#### CONCERNING THE SEPARATION OF THE DIFFERING LOTS OF ORE THAT ARE EXTRACTED FROM THE MINE

Since as the ore comes up from the mine the high grade is mixed up with the low grade as well as rock which they feel it would not pay to mill or is entirely without metal, the larger pieces are broken up, and from the whole choice is made and a separation into different lots which are distinguished alike by the size of the pieces as by the amount of silver they contain. They do not make this separation in Guanaxuato with as much exactitude as they do in Germany, but this is not necessary under the method of refining the ore which they use.

As a result of this separation some lots are sent to be refined by smelting, others by amalgamation, and others which they consider to be poor and which do not contain enough metal to justify the expenses of refining are abandoned and thrown on the dump.



In Guanaxuato they consider as unprofitable all ore which assays below three marcs of silver to a lot of ore of thirty-two quintals, and the quantity which in this manner is considered worthless and thrown away is bound to mount up to a good deal by the end of the year. All of this is not lost since there are certain poor people who spend their time going over these dumps, breaking with a hammer the pieces which have some color, and taking from these the particles which appear to contain metal, and in this way a part of that which is discarded is reclaimed again; but this part is in truth very little, and one must suppose that the greater part still remains on the dumps and no one gets the advantage of it.

There are, however, means by which this rejected ore can be made profitable since the major part of the produce of the mines of Germany and Hungary is of this type and some is even poorer. There likewise they could not afford to refine it if they tried to deal with it directly in this state, but by first concentrating its metal by means of washings and other cheap operations and reducing that which is scattered through a thousand quintals of ore to twenty, thirty, or forty quintals, they can very well afford to refine it and realize a reasonable profit. These operations are equally practicable in this country, but not in Guanaxuato itself since there is not the necessary water for them; and thus for the present I do not see any way in which the waste can be collected and put to use in that Real. The same is not the case in all the other districts; there are many in which there is plenty of water and yet in those regions they observe with very little difference the same practice as in Guanaxuato, which means that they likewise reject rock which could be profitable because they are not familiar anywhere with this type of operation, since even when they do use some washings it is not with this end in view, nor would their method be adequate to effect it.

I consider that the introduction of these operations in this country would be of great use in order to take advantage of the greater part of the large quantity which is lost at the present time, and I do not believe it would be difficult to persuade the mineowners to adopt them in the districts where they would be applicable.

#### CONCERNING THE REFINING OF THE ORE

Considering the great expenses which arise from the refining of the ore and the importance which should be given to anything that can be said concerning greater exactness in the operations, however little it may be, any saving of materials, and even of the time which these

operations consume, this branch of mining should be considered as of the greatest importance, as the most delicate, and the one which demands the most careful attention of all; because from whatever small advantage there may be attained in any one of its parts there will result consequences of the greatest importance.

The other phases of mining generally adapt themselves to a fairly easy and convenient examination, for if one has a good foundation based on simple instruction, one can readily form a fairly accurate idea of the good or bad condition existing, at least as far as the principal features are concerned; but such is not the case with the operation of refining: neither a visual examination nor reflection on this with the aid of the best knowledge available is enough. In order to form an adequate and accurate concept it is necessary to determine by experimentation both the way in which the different reagents that are used in the processes work and the different states through which they pass in the course of the process as well as those in which they are found at the end; and having done this it is necessary to seek by other experiments the best means of attaining proper remedies for the defects which the first investigation has revealed. All this demands time, leisure, and the possession of the proper equipment, instruments, and materials; and particularly because of a lack of the first two conditions, I still find myself in the position where it is impossible for me to satisfy myself completely as to the details of this vast and delicate subject. My stay in Guanaxuato has been extremely short, and having been obliged to attempt to absorb an impression of all phases, I have not been able to study any one operation in particular with that detailed application necessary to make me thoroughly familiar with its state, and as far as the subject of refining is concerned, I would have needed as many months as I have had weeks for the whole subject. Thus until another occasion gives me the opportunity to find out everything bearing on this subject, I will content myself with expounding fully the opinion which I have formed regarding it, reserving to later experience either the confirmation of this judgment or the correction of my errors.

Putting aside for the present the crushing of the ore by which means it is prepared and made ready for amalgamation, which operations are carried out with considerable skill although not without a delay and costs which might be somewhat reduced, I will now pass on to the refining itself and will begin with a discussion of the "patio" process which is the most common in Guanaxuato. I must say first of all that this process is very long drawn out since in that district the

operation ordinarily lasts five or six weeks. In all this time the quicksilver is kept in the mass mixed with the ore and the other substances which are added to it, exposed to the continuous action of the salts which keep dissolving and destroying it, there being nothing that can be done to prevent this result or to make it recover its original form and appearance, with the consequence that in the washings with which the operation is concluded the water carries it off with the slime or refuse. The quantity of quicksilver which is put into the mass does not usually exceed in the course of the whole operation six times the weight of the silver which they expect to reclaim, and this amount is surely too little to amalgamate all the minute particles of silver which occur scattered throughout such a huge mass of other materials; since if one considers that in the refining of a given lot of ore which contains two ounces of silver to the quintal, which is medium grade, there would be used twelve ounces of quicksilver to each quintal of ore, one can easily see how difficult it is for such a small quantity of such a heavy substance to suffice, however much one may suppose it to be divided in order that, spread throughout the mass of the quintal, it may reach all parts of the latter in order to collect the particles of silver which are found there without leaving intact a multitude of others. The result of this then must be that in the residue that the water carries away there is a quantity of silver which may be considerable.

From these considerations we must in consequence deduce that there appear to be certain regular defects in this method of refining; the length of the operation, the considerable loss of quicksilver, and the incompleteness in the extraction of the silver. The first is of itself evident enough; the second likewise is proved by the results, since the miners themselves admit that as a usual thing for each marc of silver that is extracted there are lost twelve ounces of quicksilver, sometimes more, sometimes less; because of which we must assume that in the refining of ore which contains only one ounce of silver to the quintal there will be a loss of an ounce and a half of quicksilver per quintal of ore, and that which contains two ounces of silver a loss of three of quicksilver, when the ore contains a marc of silver, a marc and a half of quicksilver will be lost, and thus progressively, so that one can take it as a general rule in regard to silver that there is used twelve ounces of quicksilver for each marc of silver in the quintal of ore, and while the richness of the latter may vary and increase, the factor of quicksilver lost will remain the same — that is one and a half times the weight of silver in a given amount of ore. As to the

incompleteness with which the silver is extracted, the miners themselves assume that they do not extract it completely and there are even some who will admit that in the residue a considerable proportion of silver remains, but none of them knows nor has ever known exactly how much it is, because no careful assay has ever been made either of the ore before being refined or of the residue after the operation has been concluded in order to determine with accuracy the results of these operations, the very crude assays which are at times practiced with these ores in order to get an idea of their richness being very inadequate for that purpose. The determination of this point is very interesting and essential in forming a judgment on these operations, and for this reason I was particularly sorry to return from Guanaxuato without having cleared this point up, since the shortness of the time did not permit me to construct an oven suitable for this purpose and to collect the other necessary utensils; since, although an assay made without this necessary material showed three "ochavas" of silver per quintal in the residue of one operation, I cannot count on this result with confidence.

In the new amalgamation method of Baron von Born these same features have shown the following characteristics: The calcination takes from two and a half to four hours, and the trituration, or mixing with the quicksilver, six to eight hours, at the end of which the whole operation is completed, thus lasting twelve hours instead of five or six weeks as is the case with the operation in Guanaxuato. From the results up to the present in different places the loss of quicksilver has generally been at a constant rate of six "ochavas" for each quintal of ore refined, whether it be high or low grade, and if it exceeds this the operation must be considered defective in this phase and means taken to correct it; and one can easily see what an enormous difference takes place here. As to the losses of silver, they occur in the Born method as in every metallurgical operation whatever it may be, but it only amounts to half an "ochava" or at the most one "ochava" per quintal of residue, since if it exceeds this amount the operation must be considered faulty and be corrected; it remains then to compare this result with those of the operations here in order to determine with accuracy the difference between the two methods on this point, and this I will do as soon as it is possible for me.

The miners of Guanaxuato have already been made aware of the brevity of the Born method, of the degree of completeness with which it extracts the silver, and even of the small loss of quicksilver which occurs in it (although in this last point there was not the clear evi-

dence that I might have desired) by an assay which I made during my stay in that Real with two quintals of ore which ran about six ounces of silver to the quintal; using for the calcination one of the ovens which they use here to calcinate the magistral, and for the rest various instruments and utensils which did not have all the proper qualities necessary to work with accuracy, because of which defects there resulted a greater loss of quicksilver than there should have been. Nevertheless, this assay was enough to give them, as I had intended, some confidence and dispose them to examine with impartiality and without distrust the formal assays which I will repeat carefully when I return there after the conclusion of the *Juntas Generales de la Minería*. For the present they still have some natural doubts as to whether this operation would always come out well, whether this method would be as generally applicable as theirs, and whether the expenses would not perhaps be too great.

On this last point I have not been able to give them complete satisfaction, because I have not had an opportunity to compute the cost of the Born method, which I do not believe on this point would offer any advantages over the one in use in this country which is very simple and demands a small quantity of materials such as salt and magistral, while the former is more complicated, has two different operations, demands ovens and machinery, and requires a considerable amount of wood and salt for the calcination and a rather larger number of laborers for these tasks. Until my occupations allow me to devote myself with leisure and deliberation to these questions, I cannot speak with confidence on this point, but the following is what I think at present.

The cost of operations of the Born method appears to me to be greater than those in use here, but likewise I think that however little additional silver could be extracted by this method would have sufficient value to more than equal this increased cost, leaving the advantage in the shortness of operation and the saving of quicksilver. This last would be of little import in the working of low grade ore, since in ore which ran one ounce of silver to the quintal the difference would not be more than a saving of one ounce of quicksilver in each quintal of ore refined, and the value of this would be too little to have any great influence on the cost of operation; but in proportion as the ore was richer, the saving in quicksilver would be greater and its value might then be very well worth considering and in itself enough to decide the issue in favor of the Born method. Because of this I have more doubts as to the results of this method in working poor

ore than where rich ore is concerned, and I am inclined to think that in the case of the latter this new method will surely have a place. But this does not mean that I am entirely convinced that it will have no application to low-grade ore, as it should also be noted that even though it should be proven to be the case that it was not applicable to this ore in Guanaxuato it does not follow that it might not be so in many other *Reales de Minas* which have an abundant supply of wood which is so scarce in this Real and is precisely one of the articles, or rather the most important and expensive, which is needed for the Born method.

The richest ore which is refined in Guanaxuato by the Patio method usually assays about a marc of silver to the quintal. When it exceeds this, if it is pure, in the case of the richest ore it is refined by the "Beneficio de Cazo" or by smelting, and if it is of medium grade ordinarily it is washed and the lower grade refined by amalgamation while the purer and richer ore which is called dust is refined by "cazo" or by smelting as above.

The "Beneficio de Cazo" is a method by which the silver is extracted with quicksilver in a very short time, but since it does not extract all of the metal, it is necessary to repass the residue through the Patio process to purify it more, thus making necessary two operations, for which reason, and because only a small quantity can be worked at one time in the first operation, the expenses are heavy and there is considerable loss of quicksilver, with the result that there are very few in Guanaxuato who use this method preferring in these cases the smelting process. In some other districts they say that this method is very much in use, but unless there are special circumstances in them, I am bound to consider that this method is very imperfect and cannot compete with that of Born.

I consider it superfluous to enter into a detailed discussion of what takes place in the smelting process, since, in order to understand its imperfections, it is enough to say that in addition to losing a large proportion of the silver — which neither the miners have evaluated up to the present, although they are conscious of it, nor have I made the necessary assays to determine the amount — this operation costs in Guanaxuato from fifteen to twenty pesos per quintal of ore; at least this is what those who have no smelters of their own pay when they take it to mills where it is refined by weight, since it is not easy to obtain from the owners of the latter exact figures as to the cost of this operation, because since they treat these matters with such carelessness that they cannot give the amount of wood or char-

coal used in each operation, although they have no malicious desire to hide anything. This excessive cost is enough by itself to classify this process as very inefficient, and as all the ore which is refined by this method in Guanaxuato is suitable for treatment by the Born method with greater economy than any smelting, I will not delay in discussing the effects of the latter or means of correcting them, and I will content myself with saying that for no type of ore would the application of the Born method be more useful than for this because of the great saving which would result over the present cost of smelting and the larger amount that can be extracted. Some think that the reason why ore of this type is not treated in Guanaxuato by the Patio method is because of the scarcity of quicksilver, there being no surplus over what is needed for the treatment for the low- and medium-grade ores and sometimes not even enough for this; but one hears much more generally that it is because the latter method produces less metal than smelting and causes an excessive consumption and loss of quicksilver, and from what I have seen of both methods this latter opinion seems to me much better founded than the first.

From all this then we can conclude that of all the ores which are taken from the mines of Guanaxuato, with the exception of some nuggets of silver or in the case of vitreous ore which because it cannot be well ground cannot be properly prepared for treatment with quicksilver and is more suitable to be refined by smelting, but which in a whole year would only amount to a few quintals, all the others could be treated by the amalgamation of Baron von Born. We can further conclude that of all these types of ore this method would be most useful for the rich dust which has up to the present been refined by smelting at such an excessive cost; and further that for all those of medium grade it would likewise be very useful; as to whether it would be equally advantageous for some of the poorest ores there is still some doubt, although there is evidence to make one hope that this would be the case; as, in addition to the reasons already given, there is another one of much value, namely, that the treatment of each type of ore separately demands special circumstances and greater expenses than when they are all treated together because the combination of all of the materials and the mixing of the poor with all of the rest could occasion savings of salt, shorten the calcination process, avoid the loss of the quicksilver, and even facilitate the more complete extraction of the silver; for this reason alone, even if it should be found that refining the different types of ore by themselves was more expensive by the Born method than by that of the country, the former might be a

great advantage if they were all mixed together. Finally, since there is hope that this method may be applied generally in the refining of all ores that can be treated by quicksilver, there is also a very well-founded hope that there may result from this a considerable saving of quicksilver and that in such a case its abundance will bring an end to the clamors which one hears on all sides due to the scarcity of this substance, and that for this reason as well as for its speed and the somewhat greater extraction of silver it allows, the mining industry of this country will be substantially improved, with benefit to the miners themselves, the royal treasury, and the State in general.

Mexico, twenty seventh of January, 1789

Fausto de Elhuyar



## APPENDIX D

### PLAN OF THE SCHOOL OF MINES PRESENTED TO THE ROYAL TRIBUNAL BY ITS DIRECTOR-GENERAL DON FAUSTO DE ELHUYAR, JANUARY 12, 1790<sup>1</sup>

THE DIRECTOR GENERAL, informed by the dispatch of your Excellencies of January 15 of the year just past that there were not in the archives of the Tribunal any documents relative to the formation of the School of Mines, which is provided for in Title 18 of our Ordinances, dedicated himself to the careful consideration of the plans for this establishment, and, recognizing its extent, to indicate the means which might facilitate its prompt erection.

As a result of this on the twenty-fourth of April he expounded his ideas to you with the object of consulting you as to the best arrangement, particularly on the points of internal government and economy, on which, since he is unfamiliar with the customs of the country, he felt some lack of confidence as to the correctness of his own ideas; and with the aid of your advice he has drawn up the plans according to the terms which he feels will be most adequate. He has established as the major principles which are to serve as the basis of this institution, first: that it be destined for the general and public instruction of whomsoever wishes to dedicate himself to the career of mining; second, that to this end at the beginning the Fund of the *Cuerpo de Minería* shall bear the expense of the professors, instruments, collections, and experiments which may be necessary; third, that as to a means to attain its object with greater ease and certainty there be established at the same time a Seminary for an indefinite number of young men, twenty-five of them being maintained with the necessary endowment at the expense of the said fund, these to be the descendants or close relations of miners with preference to the poorest. In conformity with these principles the Director has drawn up the following plans, in which he presents to you his succinct and general idea of the arrangements, government, and economy which he feels

<sup>1</sup>The original of this document is in *A.I., Sec. 5, Aud. de Méx., Leg. 2238*. In this translation I have attempted to follow rather literally the language of the author.

can be adopted for the present, reserving to a later time, when experience shall have thrown more light on the subject, the working out of the details of each article which deals with these subjects, adding that which at the present is omitted and correcting that which proves to be defective. He believes that with this it will be possible for Your Excellencies to proceed immediately with the formation of the College, particularly if the proposal for its opening which he makes at the end of the plan is followed.

#### ARTICLE I: CONCERNING THE TEACHING

For the convenient teaching of both the basic and auxiliary sciences related to mining and their easy acquisition by those who apply themselves to them, a four-year course will be necessary in which these sciences should be taught in the following order:

The first year pure mathematics, in which there will be included arithmetic, algebra, elementary geometry, plane trigonometry, and conic sections.

In the second year practical geometry, as applied to the usual and necessary operations of mining including in this that which is called subterranean geometry, followed by dynamics and hydrodynamics.

In the third year chemistry, reduced to that part of the science which deals with the mineral kingdom, and including likewise in this mineralogy, or the study of minerals by their external character and their internal composition, as well as the methods for analyzing them; and this will be followed by metallurgy, which deals with the different methods and operations by which the products of the subsoil are usually refined.

The fourth year would be devoted to subterranean physics, or the theory of mountains, as an introduction to the working of mines, which should follow and include all the steps which occur in subterranean excavations from the first examination of the region to the extraction of the ore and other substances from the mine.

These are the subjects which are considered necessary and at the same time sufficient for the instruction that a miner requires on the academic side, to which should be added drawing and a study of the French language as a means by which the students can by themselves extend the knowledge which they can hope to acquire from the College in only an elementary form.

For each course there will be a special professor chosen according to the Ordinances and with the qualifications necessary for the discharge of the subjects intrusted to him.

There will be in this Seminary in addition to the necessary classrooms a laboratory for models of machinery, ovens, instruments and tools, etc.; another for minerals and the products of the mills; and a chemistry laboratory.

In addition to the Public Acts and Examinations provided for in Art. 13, Tit. 18 of the Ordinances there will be at the middle of the course private examinations in order to determine the progress of the students and permit some measures to be taken in regard to the most backward ones.

For the proper understanding of the explanations of the teachers, particularly in the third and fourth years, it will be indispensable for the students to have beforehand some general ideas as to the working of mines and refining operations; to this end, as well as to make clearer by means of practical demonstration and to root more firmly in the memory the theoretical principles which have been given them in the lesson, it will be necessary that they make with their respective teachers sojourns to some of the mining districts nearest to the capital; and that there they put into practice their knowledge according to the stage of instruction of each one. For this purpose the last two or three months of the year should be chosen, by which time the courses for the year should be finished.

After the conclusion of the four years in the College the students would be distributed among various mining districts, where for two years, under the direction of trained engineers, they would get practical experience in the various operations; at the end of which time, after an examination by the Tribunal, they would be given the appropriate degrees so that they might exercise their profession in any part.

## ARTICLE II: THE QUALIFICATIONS OF THE STUDENTS

The Ordinances already provide the principal qualifications for the persons who are to be admitted as endowed scholars in this college; and we only need to add that it would be wise that none should be admitted younger than fifteen years of age or older than twenty; and that all should enter with the principles of arithmetic, well versed at least with the four rules and common fractions.

The number of students to be maintained at the expense of the Mining Fund is fixed for the present by the Ordinances at twenty-five, of which number it should be understood that only sixteen or seventeen would be in the college at one time, the others receiving practical instruction in the mining districts; four or five pupils would

finish the course each year and the same number should enter the college annually in order to provide a continuous total of twenty-five maintained by the said Fund.

Since the income of the latter comes from the partial contributions of all the mining districts of the kingdom, it would appear very fair that these twenty-five scholars should be chosen in turn, if not from all of them, at least from all the Territorial Deputations, and by the nomination of these latter, in order that the benefit which will result from this establishment will be general.

The pension which is assigned to each of these twenty-five scholars in the representation made to the King in 1774 by the representatives of the mining industry is three hundred pesos; but the Ordinance does not fix any definite sum only saying that they should be maintained with appropriate decency. In view of this and considering that the sum of three hundred pesos might prove either too little or too great, it seems best that the amount should not be determined until the experience of the first few years furnishes definite data on which to base it; in order that there may be the least difficulty with these endowed scholars it is really useless to fix any definite allowance for them, but rather that whatever is necessary for them be spent with the greatest prudence and economy. The experience of other colleges cannot serve as a guide in this case, because there will be considerable difference as to the clothing and also probably in the general social circumstances and in the cleaning and washing.

In addition to the twenty-five youths whose expense will be borne by the Mining Fund, there will be admitted in the college any others, provided that their parents or persons interested in them pay the corresponding fees; this it is indispensable to determine; but likewise it cannot be done definitely at the present time for the reasons which have already been expressed; nevertheless, not to deprive them of this opportunity during the first years, three hundred pesos might be considered as an approximate charge, provided they agree to be responsible for any additional amount that may be found necessary and likewise that the college should be obligated to return to them any surplus. Since any difference that may arise on this point will be small, it does not seem that persons interested would have any difficulty in agreeing to this arrangement.

It would seem also that the charge which would be fixed upon for these pupils should be drawn up according to the following scheme. Supposing that it was three hundred pesos when the college was obliged to furnish everything, including washing and wardrobe, it

might be fixed at two hundred pesos, for example, for simply attendance, board and lodging, and laundry; and at one hundred and fifty when the persons interested bore on their own account the expense of wardrobe, mending and laundry — it being understood that in all these cases the clothing and other equipment of each student should be of the same type, quality, and number of pieces as the first twenty-five.

The clothing should be a uniform; and, as less liable to become soiled, a blue one might be chosen with red collar and facings and gold buttons, and on this there might be stamped as a device the two letters C.M., being the initials of the *Colegio* or *Cuerpo de Minería*, or instead of this that of a crossed pick and hammer, or perhaps the three signs of gold, silver, and mercury.

The equipment of each student should comprise the following:

One complete uniform as described.

Another suit for daily wear.

Eight shirts.

Four white stocks with buckles and two black ones.

Six handkerchiefs.

Four sets of underdrawers.

Four sleeping caps.

Four pairs of silk stockings.

Six pairs of stockings.

Two pairs of shoes.

One set of gilt buckles.

Two hats.

One dressing gown.

One trunk.

One mattress.

One pillow and two pillow cases.

Four sheets.

One coverlet.

There should not be included in the annual fee agreed upon the equipment which each student should have upon entering the college; rather this should be charged separately to the account of those having students there or to the Mining Fund for those whom it maintains, including in the said annual fee only the mending and repairs necessary for this equipment.

## ARTICLE III: INTERNAL ADMINISTRATION

For the internal administration of this college the following persons will be necessary:

A chaplain who will act as rector, and, under the orders of the director, will take care of the general administration of the house, seeing to its good order and that all the inmates and employees observe and carry out exactly their respective obligations, attending especially to the good education of the students in the Christian life and doctrine and seeing that they take full advantage of their time.

A second chaplain who will be vice-rector and will aid the rector in all his functions and will be immediately under him.

A major-domo in whose charge will be the household management, the careful keeping of accounts of all expenses, the furnishing of the necessary supplies, and the supervision of the conduct of all of the servants under the orders of the rector.

A purchasing agent who will be at the same time the steward, having charge of all of the provisions and the duty of furnishing daily what may be necessary for the sustenance of the inhabitants of the house, subject to careful accounting and the previous approval of the major-domo.

The servants necessary to attend the students, serve at table, make the beds, sweep and clean, and do whatever may be necessary, the number being regulated in the relation of one for each eight or ten students.

One cook.

One scullery boy or more if necessary.

One porter.

In order that the salaries which these employees will receive may be known as well as those of the professors, they will be the following:

The Rector . . . . .	\$1000
The Vice-rector . . . . .	800
The Professor of Mathematics . . . . .	1500
The Professor of Mechanics . . . . .	2000
The Professor of Mining . . . . .	2000
The Professor of Chemistry and Metallurgy . . . . .	2000
The French Instructor . . . . .	800
The Major-domo . . . . .	600
The Steward . . . . .	300
Each of the servants . . . . .	120
The Chef . . . . .	200

The Scullery Boys, each . . . . .	80
The Porter . . . . .	200
Physician, Surgeon, and Apothecary . . . . .	500

No mention is made here of the Drawing Master because he is paid separately by the Royal Academy of San Carlos.

#### ARTICLE IV: DAILY ROUTINE

All the students will rise at six in the morning and will pass in their dressing gowns to a salon where there will be prayers and religious offices; after this, they will rise, make their toilet, breakfast, and return to their rooms to dress.

From seven to eight they will study and review their lesson.

At eight they will hear mass, which will be conducted in the College itself by the Rector or Vice-rector; and after this they will pass to their respective classes where they will remain until ten-thirty.

From ten thirty to eleven, recreation.

From eleven to twelve they will study their lessons for the afternoon.

From twelve to two-thirty, lunch and recreation or rest.

From two-thirty to three, the review of the lesson.

From three to four, attendance at their respective classes.

From four to five, French lesson.

From five to six, recreation.

From six to seven they will study the lesson for the following day.

From seven to eight they will all attend the drawing class.

From eight to nine Rosary and supper, and after the examination of their conscience, all will go to bed.

From this daily routine Thursdays, Saturdays, and Sundays will vary in the following manner:

The afternoon of the first will be one of holiday in weeks when there are not fiestas; during the afternoon of the second the hours of classes will be given over to the elements of geography which will be explained by the professor of mathematics or one of the chaplains or some other of the employees who may be qualified.

On Sundays and Feast days the study hour from seven to eight in the morning will be devoted to the study of Christian doctrine; after the mass there will be a sermon by the Rector or the Vice-rector, and after this has been concluded the students will attend some function of the church if there is any; and if there is none, or after it, they will go in groups either alone or accompanied by some official of the col-

lege to visit the Ministers of the Tribunal or other distinguished persons, in order that by this means at the same time that they absorb intellectual instruction they may learn something of the manner of Society.

In the afternoon they will attend some function of the church if there is one, take a walk, return to the college at sunset, and have an hour of study from six to seven in place of the drawing class which will not be held on these days; for the rest the same routine will be followed as on ordinary days.

The students will make their confession every month, choosing for it the feasts of our Lord or of the Holy Virgin and if there is not one, the last Sunday of the month. There will be two or three days a year in the country for all the students, and in addition a special one for those whose examinations have won them prizes.

#### ARTICLE V: MEALS AND CARE OF THE STUDENTS

The students will eat in groups of eight or any other convenient number at various tables in charge of the Rector, Vice-rector, and Major-domo, who will eat with them in order that, observing them at close range, they may see that they are clean and neat and accustom them to the manners of civilized Society; and, in order to avoid any feeling, each group will alternate tables from week to week.

The meals which they will receive daily will be the following:

1. Breakfast with chocolate.
2. At midday, soup, "olla," an entree, and dessert.
3. At two in the afternoon, chocolate.
4. At night, supper with salad, a roast, vegetables, and dessert. On Christmas and other special occasions there would be something extra.

The washing, ironing, and mending will be done for those who have contracted for it.

Each student will weekly give his clothes that need washing and mending to one of the servants with a note of the articles which there are; the latter will hand it over to the Major-domo who will be the one who makes arrangements with the laundress, tailors, and shoemakers. And likewise the Major-domo will return the clean and mended clothes to their respective owners by means of the corresponding servant. For this purpose the students will be divided into groups with a special servant to take care of each group.

For illness of any seriousness there will be a separate room where the sick may be quiet and without molestation.



For the recreation of the students there may be a billiard table, all card games being strictly prohibited as well as any game of chance; and for certain diversions or for other purposes that may occur each student may be given two Reals every Sunday.

Such in the sum is what the Director believes he should propose to Your Excellency at the present time, limiting himself to giving a general idea of this establishment and the most necessary details of its government; and in this he has managed to follow the provisions of Tit. 18 of the Ordinances, from which the plan departs only in the length of time in which the students shall spend in practical work after the conclusion of their studies in the College, this being limited to two years instead of the three which Art. 14 of the said Title prescribes, since once the classes are well established this time would seem to be sufficient.

In the arrangement which he proposes the director ignores any increase or decrease in the attendance either among those living within the Seminary as Scholars or those attending the classes from the outside, feeling that the organization is independent of these factors, since the number of students will make no difference in the administration of the classes nor in the number and qualifications of the professors and the officials, and will only cause some difference in the size of the buildings and the number of servants.

Although in this plan the general arrangements which are considered most advantageous for this establishment are expounded, it is recognized that there are various difficulties which will prevent it being put into practice completely at first. Among these are the following:

First, that the building intended for this college is not divided up or arranged in the most convenient manner and some time will be necessary to prepare it.

Second, that since there is no supply of instruments, models, equipment, and materials necessary for the teaching of the various sciences and courses which are to be taught, one cannot hope for as rapid progress as under ordinary circumstances, particularly as most of this equipment will have to be sought in Europe.

Third, that likewise some time will be necessary for the investigations and formalities necessary for the appointment of all of the professors.

Fourth, that since the students should follow the course of their

studies in the order established, it is not to be expected that boys qualified in all the classes will be found right away.

Because of all this the Director believes that it is neither necessary nor in any way desirable that the College should immediately begin with the complete program of classes and daily routine laid down in the present plan; and it seems to him that the important thing to plan for now is the opening of the College as soon as possible, even though it be only partial and provisional; reserving until later the working out of the details and the taking of the measures necessary to complete it.

In consequence of this, the Director proposes to Your Excellencies that the instruction in the first year be limited to the first of the four principal classes which the plan provides for; that the following year this one be continued and the second class be begun; and that the third year, if possible, the other two classes be started; with the result that in two years or at the most three all the essential parts of the college will be running in complete form.

With this arrangement there will not be necessary for the first course the equipment which is indispensable for the three succeeding ones, and there will be time to acquire it before it is needed. Likewise it will be sufficient for the first year to have one professor of mathematics, who can be Don Andres José Rodriguez according to the terms suggested in the separate opinion which the Director has already rendered to Your Excellencies in compliance with the Royal Order of the 18th of April 1778; and as to the others they can be considered as they are needed.

The Director realizes that by following this plan at the beginning and only admitting four or five endowed students in each year, at the end of six years only four or five persons will have received full instruction, and as a result the progress of the College will be very slow in this respect.

In order to compensate for this drawback and provide that at the end of the six years covered by the courses and the practical training there would be the same number of graduates which there would be if the four classes were established at one time with four endowed students admitted to each one, it would seem wise that in the first year sixteen or seventeen should be admitted and in the second and following years only the four regular ones; the first sixteen or seventeen would pursue together the first and second courses; the third year they would be divided into two groups of which one would

study chemistry and metallurgy and the other mining engineering; the fourth year the classes would be exchanged, and the fifth all would pass on to the practical training, concluding it in the sixth; thus, the same number of graduates would result as if all the classes had been established at one time.

It is true that in this case the mining fund would have spent some 8000 pesos more at the end of the six years than under the latter arrangement; but this would be compensated for by the ten thousand which would be saved in the first two years by the salaries of the professors; and thus, this plan would not be at all burdensome to the Fund.

This plan appears to be the most satisfactory under the present circumstances, in order not to delay the establishment of the College, and likewise to avoid the confusion, little profit, and bad consequences which would ensue from trying to place it in full running order all at once, with all there is lacking at the present time for its orderly functioning.

Fausto de Elhuyar

Mexico, January 12, 1790

## APPENDIX E

### LIST OF INSTRUMENTS AND APPARATUS ORDERED IN LONDON FOR THE SCHOOL OF MINES

1796

LISTA DE LOS INSTRUMENTOS, APARATOS &C DESTINADOS AL  
GABINETE DEL COLEGIO DE MINERIA DE MEXICO <sup>1</sup>

*Los que tienen una R. al margen se han remitido ya de  
Londres a Cadiz*

	<i>L. est.</i>	<i>Sh.</i>	<i>peniques</i>
Aparato para la composicion y resolucion de las potencias . . . . .	16	16	0
Yd. para el movimiento en la cycloide . . . . .	10	12	0
Yd. para experiencia en el plano inclinado . . . . .	21	0	0
Yd. de maquina simples . . . . .	60	0	0
Yd. de fuerzas centrales . . . . .	26	5	0
Bombas de Hesse y de Vera . . . . .	6	6	0
Aparato de Mariote para la percusion . . . . .	11	11	0
Paradoxa de Pascal . . . . .	12	12	0
Aparato de tubos comunicantes . . . . .	4	14	6
Cilindro de cristal con tubo, en un pie . . . . .	3	13	6
Vegiga hydrostatica . . . . .	3	3	0
Fuente de compresion . . . . .	3	5	0
Bombas de aspiracion y de presion . . . . .	12	12	0
Bomba de cadena perfeccionada . . . . .	21	0	0
Maquina pneumatica de la construccion americana . . . . .	42	0	0
Maquina de condensar . . . . .	15	15	0
Aparato completo para la maquina pneumatica . . . . .	60	0	0
Yd. para saltaderos fluidos . . . . .	1	11	6
Digestador de Papin . . . . .	16	16	0
Pyrometro de la construccion de Ramsden . . . . .	75	0	0

<sup>1</sup> A.I., Sec. 5, Aud. de Méx., Leg. 2247.

	<i>L. est.</i>	<i>Sh.</i>	<i>peniques</i>
Aparato para la Cuna .....	12	12	0
Bomba centrifuga de Barker .....	3	3	0
Eolipila ( <i>sic</i> ) y carruage .....	4	14	6
Maquina para mostrar la figura de la tierra	5	15	6
Suma .....	452	17	6
Suma de la vuelta .....	452	17	6
Balanza con pesos para hemisferios grandes ..	3	15	0
Maquina de Atwood .....	23	2	0
Escopeta de viento .....	8	8	0
Balanza hydrostatica con hydrometro .....	32	0	0
Fuente de Hero .....	3	3	0
Fuente intermitente .....	3	3	0
Syfones y otros articulos pequenos .....	4	4	0
Aparato de Zanoti ..	3	10	0
Areometros de Schmeifrer &c .....	12	12	0
Maquina de Rodella para la percusion de los cuerpos elasticos &c .....	52	10	0
Modelo completo de una Boma de fuego de la mejor construccion con caldera y todo lo necesario para hacerla mover .....	178	18	8
Diferentes maquinas que pueden adaptarse a la bomba antecedente para mostrar el modo de aplicar este agente a diferentes objetos utiles segun se practica en In- glaterra .....	36	11	6
Otros modelos de maquina sueltaas neces- sarios para el objeto de la coleccion .....	109	13	6
Balanza de Sanctorio .....	12	12	0
Balanza para grandes pesos .....	17	0	0
Balanza grande para pesar con mucha exac- titud en sire y agua de la construccion de Ramsden .....	96	15	0
Balanza de ensayo .....	10	10	0
Dos roscas de Archimedes .....	6	6	0
Dos niveles de agua .....	5	5	0
Dos Eudiometros .....	6	6	0
Dos Hygrometros grandes y dos pequenos ..	10	10	0
Dos termometros de Wedgwood .....	6	0	0
Tres Termometros regulares .....	3	3	0

	<i>L. est.</i>	<i>Sh.</i>	<i>peniques</i>
Otro idem .....	1	1	0
Suma .....	1123	7	8
Suma de enfrente .....	1123	7	8
Quatro Termómetros con caja dobladizas .	8	8	0
Quatro id. cuyos tubos estan metidos en otros de vidrio .....	10	10	0
Dos id. transparentes puestos en chapas de plata .....	6	6	0
Dos Barómetros estables .....	5	5	0
Dos id. portátiles .....	16	16	0
Un anemómetro .....	26	5	0
Un Pluviómetro .....	10	10	0
Aparato químico-pneumático pequeño ..	6	6	0
Aparato químico-pneumático grande de Wat	25	0	0
Aparato para componer agua con aires ..	23	0	0
Aguja de inclinación .....	26	5	0
Globo bien montado terrestre .....	18	18	0
Id. celeste .....	18	18	0
Surtido de barras magnéticas .....	10	10	0
Aparato de magnetismo en una caja .....	6	6	0
Cinco lentes de diferentes formas y cortas distancias focales .....	1	0	0
Tres id. convexas de 4½ pulgadas de foco ...	0	9	0
Quatro id. convexas de 8 pulgadas de foco .	0	8	0
Dos cubos de cristal de dos pulgadas de lado	4	4	0
Una lente convexa de 6 pulgadas de diametro y tres pies de foco con el pie correspondiente .....	2	12	6
Un espejo de metal con su pie para reflexar los rayos solares en un quarto obscuro . .	3	3	0
Seis prismas equiangulares montados para darles los movimientos que se quieran .	7	10	0
Dos id. rectangulares montados de modo que pueden usarse juntos o separados ...	4	0	0
Quatro pies de caoba para prismas, uno con placa de laton &c .....	1	18	0
Suma .....	1388	15	2
Suma de la vuelta .....	1388	15	2

	<i>L. est.</i>	<i>Sh.</i>	<i>peniques</i>
Tres prismas con caras de cristal, formando diferentes angulos para llenarlo de agua, o de qualquier otro fluido . . . . .	2	5	0
Dos lentes de distancia focal mui considerable aplicada a una forma metalica con tornillos, a fin de mostrar los circulos de colores . .	5	0	0
Una prisma con lados movibles y arcos divididos para ponerlo en el angulo que se quiera. Y dos prismas pequenos de cristal para el mismo aparato . . . . .	4	4	0
Un juego de prismas pequenos para demostrar la teorica de la lente aeromática . . .	1	11	6
Un Telescopio de reflexion, con un espejo de dos pies de foco, montado para adoptarlo a la construccion newtoniana, gregoriana o de Cassegrain . . . . .	45	0	0
Un Micrometro objetivo aplicado al mismo . . . . .	21	0	0
Un Anteojo aeromático de tres pies de largo con tubo de laton bien montado . . . . .	31	10	0
Un Anteojo de quatro pies de largo con diferentes objetivas una simple, otra aeromática de dos lentes, y otra aeromática de tres lentes, con pie &c . . . . .	24	3	0
Una Camara obscura . . . . .	6	6	0
Un dinametro . . . . .	2	2	0
Una caxa de caoba para diferentes objetos . .	2	5	0
Una lente cutoria . . . . .	21	0	0
Un espejo concavo de 18 pulgadas de diametro . . . . .	8	8	0
Uno id. convexo de 15 pulgadas de diametro . .	4	4	0
Un espejo cilindrico de 8 pulgadas de alto . .	1	11	6
Un Microscopio ordinario . . . . .	4	14	6
Un Microscopio doble . . . . .	15	0	0
Un Microscopio de luz artificial . . . . .	25	0	0
Suma . . . . .	1613	19	8
Suma de enfrente . . . . .	1613	19	6
Un Microscopio aquatico de Ellis . . . . .	3	13	6
Un Microscopio solar . . . . .	21	0	0

	<i>L. est.</i>	<i>Sh.</i>	<i>peniques</i>
Modelo de los rayos de luz . . . . .	1	11	6
Modelo del ojo en tres diferentes estados ..	3	3	0
Modelo para explicar la teorica del anteojo ..	1	16	0
Modelo para explicar la teorica del Telescopio . . . . .	1	11	6
Linterna magica con los movimientos de los cuerpos celestes &c . . . . .	18	18	0
Lampara magica electrica . . . . .	12	0	0
Campanas magicas . . . . .	4	0	0
Campanas simples . . . . .	1	0	0
Instrumento para explicar la accion de las precedentes . . . . .	4	4	0
Aparato para probar que el fluido electrico no excluye el aire . . . . .	0	8	0
Para electrizar en el vacio . . . . .	2	14	0
Plano inclinado . . . . .	0	14	0
Electrometro de Brook . . . . .	6	0	0
Aparato para calcinar alambres . . . . .	2	2	0
Fuente de metal con pie aislado . . . . .	3	0	0
Planetario . . . . .	1	0	0
Casa para rayos ordinaria . . . . .	0	15	0
Excitador aislado . . . . .	0	18	1
Maquina pneumatica de mesa de la construccion de Cuthbertone . . . . .	35	10	0
Id. de condensar . . . . .	10	10	0
Mesa para las atecedentes . . . . .	3	3	0
Rueda movable por si misma . . . . .	3	0	0
Aparato con un barco para mostrar el uso de los pararayos . . . . .	3	10	0
Aparato para mostrar que la carga electrica pierde en un largo circuito . . . . .	1	10	0
Suma . . . . .	1761	11	2
Suma de la vuelta . . . . .	1761	11	2
Maquina electrica de plato pequeno . . . . .	7	0	0
Aparato para la explosion lateral . . . . .	2	3	6
Aparato de Noltet con tres jarros . . . . .	0	16	0
Bateria electrica . . . . .	48	0	0
Conductores para comunicar las baterias ..	6	16	6



	<i>L. est.</i>	<i>Sh.</i>	<i>peniques</i>
Dos mesas corredizas . . . . .	2	2	0
Conductor luminosa y pie . . . . .	2	2	0
Tubo espiral . . . . .	0	10	0
Volantes horizontales y verticales . . . . .	2	2	0
Circulos de laton para idem . . . . .	0	7	0
Jarro para demostracion . . . . .	2	0	0
Excitador universal . . . . .	2	9	0
Tubo de cristal estanado y montado con llave . . . . .	1	0	0
Bomba de condensacion para el antecedente y para la Fuente de metal . . . . .	1	10	0
Electrometro athmosferico . . . . .	1	10	0
Balon de cristal luminoso . . . . .	2	0	0
Aurora boreal . . . . .	0	10	6
Aparato para mostrar que los jarros de las baterias deben cargarse baxos . . . . .	1	18	0
Jarro doble . . . . .	0	14	0
Recipiente para bolas animadas . . . . .	0	8	0
Tenedores para fundir alambres &c . . . . .	0	18	0
Instrumento para quemar yesca &c . . . . .	0	10	0
Aparato para explicar la carga del cristal estanado . . . . .	1	10	0
Aparato para comunicar e invertir el fluido electrico . . . . .	0	18	0
Maquina electrica de dos platos de tres pies ingleses de diametro . . . . .	100	0	0
Maquina electrica de cilindro . . . . .	11	11	0
Electroforo . . . . .	2	12	6
Suma . . . . .	1965	9	2
Suma de enfrente . . . . .	1965	9	2
Maquinas de caston . . . . .	3	3	0
Aparato sobre la penetrabilidad del cristal por el fluido electrico . . . . .	0	16	0
Id. sobre la impenetrabilidad . . . . .	0	16	0
Jarro aislado con tubo . . . . .	0	12	0
Dos Jarros con un electrometro . . . . .	0	18	0
Dos Jarros para dar diferentes choques . . . . .	0	14	0
Un baston conductor . . . . .	2	10	0

	<i>L. est.</i>	<i>Sh.</i>	<i>peniques</i>
Bateria electrica pequena . . . . .	3	3	0
Termometro electrico de Rinneriley . . . . .	1	1	0
Electrometro quadrante . . . . .	0	10	6
Electrometro de oja de oro de Bennet . . . . .	0	18	0
Palabra luminosa . . . . .	1	11	6
Jarro con faxas . . . . .	1	1	0
Arana electrica y jarro . . . . .	2	2	0
Pistola electrica para aire inflamable . . . . .	0	18	0
Canon electrico . . . . .	0	12	0
Almacen de polvora . . . . .	1	1	0
Pyramide . . . . .	1	1	0
Duplicador de Nicholson . . . . .	3	3	0
Duplicador de Cavallo . . . . .	3	3	0
Velador electrico . . . . .	0	10	6
Pintura magica . . . . .	0	10	6
Banco electrico . . . . .	0	10	6
Condensador de Volta . . . . .	1	11	6
Tubo de cristal para convertir el aire en agua y vice-versa . . . . .	0	5	0
Aparato para el antecedente . . . . .	1	10	6
Aparato para fundir metales en diferentes aires . . . . .	1	1	0
Jarro lunarado . . . . .	0	9	0
Eudiometro electrico de Volta . . . . .	2	10	0
Suma . . . . .	2004	1	8
Suma de la Vuelta . . . . .	2004	1	8
Balon de Priestley para convertir el aire en acido . . . . .	1	1	0
Excitador luminoso . . . . .	0	9	0
Esfera de laton para la explosion de la chispa electrica . . . . .	0	18	6
Jarro para idem . . . . .	0	4	0
Cometa electrico y aparato . . . . .	12	12	0
Alambiques, crisoles, morteros, evaporatorios, balones, jarros, botellas &c. &c. &c. que no pueden especificarse menudamente en esta noticia . . . . .	432	2	6
Alquiler de un quarto para conservar y			

	<i>L. est.</i>	<i>Sh.</i>	<i>peniques</i>
probar los instrumentos a dos guineas ( <i>sic</i> ) y media al mes desde 1 <sup>o</sup> de Octubre de 1793 haste fin de abril de 1796 . . . . .	76	7	6
Mandados carruages, gratificaciones a obre- ros, y varios gastos sueltos hasta fin de abril ultimo . . . . .	39	18	0
Costo de cincuenta y dos caxones remitidos	61	0	6
Suma total . . . . .	2628	14	8

## NOTA

Hasta el día de la fecha los pagamentos que he hecho y que he mandado hacer a los Sres. Garay y Ca. a cuenta de esta coleccion ascienden a dos mil doscientas treinta livras esterlinas, y catorce shelines.

Los precios de varios instrumentos podran tener variaciones no siendo dable arreglarlos definitivamente hasta concluir el total encomendado a cada artista.

Tambien podran agregarse o suprimirse al fin algunos aparatos.

En la lista que precede no estan especificadas las cantidades de algunos metales en bruto que estan pedidas, como tampoco diferentes articulos que se han de remitir de repuesto para el uso de la coleccion.

Tampoco esta incluso el costo de los dibujos que se estan haciendo para las descripciones de varios aparatos.

Los Sres. Garay y C. han hecho ademas diferentes desombolsos para transporte, seguros &c.

Londres y Julio 3 de 1796.

Josef de Mendoza Rios

Rubrica

Foja 5 vta, en blanco

## BIBLIOGRAPHY

### 1. MANUSCRIPT SOURCES

EXCEPT FOR CHAPTER I and parts of Chapter VII, this study is based almost entirely on unpublished manuscript material in the *Archivo General de la Nación de México* and the *Archivo General de Indias* in Seville (referred to as "A.G." and "A.I." respectively). The material from the Mexican archives comes from three sources, all in the *Ramo de Historia* of that collection. The first is the section known as *Correspondencia de los Virreyes*. This is in three series, the first containing fifty-six bound volumes and extending from 1760 to 1819; the second, two hundred and eighty-five volumes, from 1760 to 1821; and the third, three volumes covering various periods. Of these, the second series was by far the richest source for this study. The material from this section is in the form of dispatches from the various Viceroys to the Ministry in Spain and affords a wealth of information on all phases of the Tribunal and *Cuerpo de Minería*. Its value varies somewhat with the different Viceroys, the dispatches of Bucareli and Revillagigedo being the most informative. The second section consulted was that entitled *Reales Cédulas y Ordenes*, volumes 96-227, 1770-1821. As its title indicates, this section contains dispatches from the Ministry in Spain to the Viceroy making known the royal will on every variety of subject. It includes virtually all the measures of importance taken during these years which concerned the mining industry, besides a multitude of instructions on minor phases of the industry. The most important source of all in the Archivo General of Mexico was the section known simply as *Minería*. This section is composed of two hundred and thirty volumes each containing anywhere from two hundred to a thousand pages of manuscript bound together with no system or order whatsoever. Some of the volumes contain documents with no connection to mining — such as reports of the *Renta de Tabacos* and of the customs house of Veracruz. Furthermore, in the volumes devoted entirely to mining documents there is no attempt at chronological arrangement; documents of the sixteenth and nineteenth centuries are bound together indiscriminately. Hence the first task was to make a calendar of the contents of the entire section, volume by volume. This revealed that the bulk of the documents

had to do with private litigation over mines and were of no direct value for the purposes of this study. In between these, however, were sandwiched a great number of relevant and important documents which have contributed valuable material. These are of all sorts: correspondence of the Tribunal with the Viceroy, the provincial deputations and other official agencies and individuals; *informes* and representations of the Tribunal on a variety of topics; miscellaneous accounts, and expedientes on special subjects. There is such a tremendous volume of material, much of it unimportant, that only what appeared to the writer to be the most significant items were chosen, and it is possible that some of importance were overlooked.

The material from the Archivo de Indias in Seville was in much better order. Virtually all of this was found in Legajos 2235-2253 of Section 5, the Audiencia de México. This material is of a varied nature. Many of the documents are duplicates of ones found in Mexico (or the originals where the duplicates are in Mexico) but a great deal of new material was discovered. This includes dispatches from the Tribunal to the Ministry, numerous *informes* of the Tribunal and individuals, opinions of various royal ministers on many subjects connected with the Mining Guild, and countless other miscellaneous documents. Again only what appeared to be the most significant were selected.

Inasmuch as a listing of every document used would run to a total of hundreds of items and as they are all cited in the footnotes, only certain of the larger and more comprehensive expedientes are listed below. The following are in the Archivo General de Indias, Seville, Section 5, Audiencia de México:

Elhuyar, Fausto de, Reflexiones sobre el laboreo de minas y operacion de los beneficios de este Real (Guanajuato), January 27, 1789. Legajo 2241.

Elhuyar, Fausto de, Reflexiones sobre las Diputaciones Territoriales de Minería, Mexico, July 30, 1791. Legajo 2243.

Elhuyar, Fausto de, Discursos sobre la Minería y su gobierno en general, constitución actual de la de Nueva España, y Reformas convenientes en ella, Mexico, May 7, 1813. Legajo 2250.

Expediente sobre la formación de Ordenanzas por el Cuerpo de Minería, 1778-1783. Legajo 2236.

Expediente sobre arreglo y reforma del Tribunal de Minería, 1786-1822. Legajos 2237 and 2238.

Expediente sobre formación del Tribunal de Minería, 1774-1777. Legajo 2240.

Expediente sobre arreglo del Colegio de Minería y envío de instrumentos, maquinas, y utensilios para el, 1790-1803. Legajo 2247.

Expediente sobre establecimiento de Bancos de Rescate de Platas, 1819. Legajo 2249.

Expediente sobre elecciones, cuentas, y Juntas Generales, 1793-1800. Legajo 2246.

Testimonio del Expediente promovido por el Tribunal General de Minería sobre que se reintegre el millon de pesos que suplio a S.M. en la ultima Guerra (año de 1788). Legajo 2241.

The following expedientes are in the Archivo General de la Nación, Mexico, *Ramo de Historia, Sección de Minería*.

Arreglo de Cuentas del Tribunal de Minería, 1794-1803. Vol. 102.

Cuenta General del Tribunal de Minería, 1777-1787. Vol. 63.

Cuenta particular de los gastos extraordinarios del Tribunal de Minería, 1777-1787. Vol. 208.

Cuenta particular de las negociaciones avilitadas por el Banco de Avios del Tribunal de Minería, 1784-1787. Vol. 208.

Gobierno del Real Tribunal de Minería, 1777-1787. Vol. 30.

Expediente sobre exencion de Alcabalas de los objetos de Minería, 1781. Vol. 187.

Expediente sobre los derechos que deberan gozar los Peritos Facultativos de Minería, 1796-1805. Vol. 74.

Expediente sobre el ejercicio de la jurisdicción contenciosa en segundas instancias de negocios de minas, 1793-1794. Vol. 95.

Expediente sobre formacion del Tribunal de Minería de este Reyno, 1777. Vol. 60.

Testimonio de votos secretos que de su letra y puño asento el Senor Don Julian Antonio del Hierro Diputado y Administrator que fue del Real Tribunal de Minería en libro reservado, 1788. Vol. 110.

Votos de los vocales de la Junta de Arreglo del Tribunal de Minería sobre los puntos que tocan a su arreglo y reforma, 1790. Vols. 155-156.

In addition to the documents in the Archives of Mexico and Seville two other manuscripts were useful in this study. The first is a

bound volume entitled *Minería: Ordenes y Oficios*, 1801-1808, found in the Library of the Engineering School of the University of Mexico (the old School of Mines). This contains various resolutions and decrees of the Tribunal relating to the School and is apparently the only surviving volume of what was once a complete record. The second is a manuscript entitled *Informe acerca de la Minería de Nueva España*; it is in a collection known as the *Papeles precedentes del Archivo de Don Antonio del Río* (grandson of Professor Andrés del Río) and was loaned the writer by the present owner, Professor Federico Gomez de Orozco, of the Museo Nacional. This manuscript is anonymous and without date, but from internal evidence appears to have been written by the Tribunal about 1815.

## 2. PRINTED DOCUMENTS AND OTHER CONTEMPORARY SOURCES

Beleña, Eusebio Buenaventura de, *Recopilación sumaria de todos los Autos Acordados de la Real Audiencia y Sala del Crimen de esta Nueva España*, 2 vols. (Mexico, 1787). This is particularly useful for the decrees on the Alcabala and the mining of quick-silver.

Elhuyar, Fausto de, *Indagaciones sobre la Amonedación en Nueva España* (Madrid, 1818). Originally read to the Tribunal on August 10, 1814, this discourse had great influence on the report of the Committee on Mining of the Cortés of 1821.

Gálvez, José de, *Informe general que en virtud de real orden instruyo y entrego el Exmo. Sr. Marques de Sonora, siendo Visitador General de este Reyno, al Exmo. Sr. Virrey Frey D. Antonio Bucarely y Usrua, con fecha de 31 de diciembre de 1771*. In many ways this Informe set in motion the machinery for the organization of the *Cuerpo de Minería* and the formation of the new Ordinances.

Gamboa, Francisco Xavier de, *Comentarios a las Ordenanzas de Minas* (Madrid, 1761). Invaluable for the study of the mining industry prior to the organization of the Tribunal; inasmuch as Gamboa's suggestions were not followed, he always viewed the latter with disfavor.

*Gaceta de México*, 1784-1809. Contains considerable news about the School.

*Instrucciones que los Virreyes de Nueva España dejaron a sus sucesores* (Mexico, 1867). The instructions of Flores, Branciforte, and Marquina all contain references to the *Tribunal de Minería*.

Lassaga, Juan Lucas de, and Velásquez de León, Joaquín, *Representación que a nombre de la Minería de esta Nueva España, hacen al Rey . . .* (Mexico, 1774). This is the representation which was the basis for the whole later organization of the *Cuerpo de Minería*.

*Los Codigos Españoles Concordados y Anotados*, 12 vols. (Madrid, 1847-1850). Useful for the background of early laws relating to mining.

Mexico: Comisión de Minería, *Dictamen presentado al Soberano Congreso de la Republica* (Mexico, 1824). A report embodying recommendations similar to the measures adopted by the Spanish Cortés in 1821.

*Ordenanzas de Minería y Colección de las Ordenes y decretos posteriores a su publicación*. Nueva edición (Paris and Mexico, 1881). A late edition of the next item with amendments of both the colonial and republican periods.

*Reales Ordenanzas para la Dirección, Regimen, y Gobierno del Importante Cuerpo de la Minería de Nueva España* (Madrid, 1783). The original official edition of the *Ordenanzas*.

*Real Ordenanza para el Establecimiento e Instrucción de Intendentes de Ejercito y Provincia en el Reyno de Nueva España* (Madrid, 1786).

*Recopilación de los Leyes de Estos Reynos* (Castilla); 3 vols. (Madrid, 1640).

*Recopilación de Leyes de los Reynos de las Indias*, 4<sup>a</sup> impression (Madrid, 1791).

*Representaciones del Real Tribunal de Minería a favor de su Importante Cuerpo, . . . sobre que los utensilios . . . y demás efectos que . . . conducen al laboreo de las minas no causan Alcabala* (Mexico, 1781).

Revillagigedo, Juan Vicente Guemez, Pacheco, Padilla y Horcacitas, Conde de, *Instrucción reservada que el Conde de Revillagigedo dió a su sucesor en el mando, Marqués de Branciforte, sobre el Gobierno de este Continente en el tiempo que fue su Virey*. (Mexico, 1831). Revillagigedo made a number of important observations on the *arreglo* of the Tribunal and the usefulness of the German miners.



Solórzano Pereira, Juan de, *Política Indiana*, 2 vols. (Madrid, 1629-1639, 1776). Francisco Ramiro de Valenzuela, ed. contains some information on the early mining law of the colonies.

Velásquez, Primo Feliciano (ed.), *Colección de documentos para la historia de San Luis Potosí*, 4 vols. (San Luis Potosí, 1897-1899). Contains information relative to the founding of this important mining center.

### 3. OTHER WORKS CONSULTED

Aguilar y Santillan, Rafael, "Bibliografía Geológica y Minera de México," *Boletín del Instituto Geológico de México*, Nos. 10-15. 1898-1901. While this collection is devoted principally to works of a scientific and technical nature, it is the best general guide to the literature on mining in Mexico.

Arnaiz y Frez, Arturo, "D. Fausto de Elhuyar y de Zubica," *Revista de historia de America*, No. 6.

Aiton, A. S., "The First American Mining Code," *Michigan Law Review*, XXIII, No. 2, pp. 105-114.

Alemán, Lucas, *Historia de Mejico desde los primeros movimientos que prepararon su Independencia en el año de 1808 hasta la epoca presente*, 5 vols. (Mexico, 1849-1852). Vol. I contains some interesting comments on the *Cuerpo de Minería* by this author who was a graduate of the School of Mines.

Amador, Elías, *Bosquejo Historico de Zacatecas* (Zacatecas, 1892).

Baca, Eduardo Martinez, "Historical Sketch of Mining Legislation in Mexico," American Institute of Mining Engineers, *Transactions*, XXXII (1903), 520-563.

Bancroft, H. H., *History of Mexico*, 6 vols. (San Francisco, 1883-1887).

Becker, Jeronimo, *La política Española en las Indias* (Madrid, 1920).

Bernstein, Harry, "Spanish Influences in the U. S.," *H.A.H.R.* XVIII, No. 1.

Bolton, Herbert E., *Guide to Materials for the History of the United States in the principal Archives of Mexico* (Washington, 1911).

Busto, Emiliano, *Estadística de la República Mexicana*, 3 vols. (Mexico, 1880). Vol. II is devoted to mining and contains useful figures on the growth of the industry.

- Campillo y Cosío, José de, *Nuevo Sistema de Gobierno Económico para la América* (Madrid, 1789).
- Castelazo, José Rodrigo de, *De la Riqueza de las Minas . . . de Real del Monte* (Mexico, 1820).
- Cavo, Andrés, *Los Tres Siglos de México durante el Gobierno Español hasta la Entrada del Ejército Trigarante; Obra escrita en Roma por el Padre D. Andres Cavo de la Compañía de Jesús. Publicada con Notas y Suplemento en 1836 por el Lic. D. Carlos María de Bustamente* (Jalapa, 1870).
- Chism, Richard E., "A Synopsis of the Mining Laws of Mexico," American Institute of Mining Engineers, *Transactions*, Vol. XXXII (1902), 3-35.
- Colmeiro, Manuel, *Historia de la Economía Política en España*, 2 vols. (Madrid, 1863).
- Crespo y Martínez, Gilbert, *México — Industria Minera: Estudio de su Evolución* (Mexico, 1903).
- Croix, Charles Francios, Marqués de Croix, *Correspondence de Marquis de Croix, Capitaine General des Armées de S. M. C., Vice-Roi du Mexique* (Nantes, 1891). Charles Marie Philippe de Croix, ed.
- Cunningham, C. H., *The Audiencia in the Spanish Colonies* (Berkeley: University of California Press, 1919).
- Dahlgren, Charles B., *Historic Mines of Mexico* (New York, 1883).
- Danvilla y Collado, Manuel, *Reinado de Carlos III*, 6 vols. (1891-1896). In Real Academia de la Historia, Madrid, *Historia General de España*, 18 vols. (Madrid, 1890-1898). Antonio Canovas del Castillo, ed.
- Duport, St. Clair, *De la Production de Metaux Precieux au Mexique*, 2 vols. (Paris, 1843).
- Fisher, Lillian Estelle, *The Background of the Revolution for Mexican Independence* (Boston: Christopher Publishing House, 1934).
- *The Intendant System in Spanish America* (Berkeley: University of California Press, 1929).
- *Viceregal Administration in the Spanish Colonies* (Berkeley: University of California Press, 1926).
- Fonseca, Fabian, and Carlos de Urrutia, *Historia General de Real Hacienda, escrita . . . por orden del Virey Conde de Revillagigedo*, 6 vols. (Mexico, 1845-1853). Vol. I contains valuable chapters on the *quinto*, quicksilver, and the mint.

- Garcia, Trinidad, *Los Mineros Mexicanos* (Mexico, Sec. de Fomento, 1895). A collection of articles on the history of various mining centers useful for the background of the *Cuerpo de Minería*.
- Halleck, Henry W. (ed.), *A Collection of Mining Laws of Spain and Mexico* (San Francisco, 1859). This contains the full text of the Ordinances in English together with numerous other Royal orders and Viceregal decrees concerning mining from 1778 to 1820.
- Haring, C. H., "American Gold and Silver Production in the first half of the Sixteenth Century," *The Quarterly Journal of Economics*, XXIX (1915), 433-479.
- Heron de Villefosse, A. M., *De La Richesse Minérale*, 3 vols. and maps (Paris, 1810-1819). Describes the mineral regions of America and Spanish mining legislation.
- Humboldt, Alexander von, *Ensayo Politico sobre el Reyno de la Nueva España*, 4 vols. (Paris, 1822). Traducido al Espanol por D. Vicente Gonzalez Arnao. Besides a valuable discussion of the development of the amalgamation process in Mexico and interesting comments on the *Cuerpo de Minería* in the text, this edition has a supplement giving the report of the Committee on mining to the Cortés in 1821.
- Juan, Jorge, and Ulloa, Antonio de, *Noticias Secretas de America* (Madrid, 1826).
- Marmolejo, Lucio, *Efemerides Guanajuatenses*, 4 vols. (Guanajuato, 1883).
- Martínez Alcubilla, Marcelo, *Diccionario de la administración Española, Peninsular, y Ultramarina*. 12 vols. (Madrid, 1868-1870).
- Mecham, J. L., "The Real de Minas as a Political Institution," *H.A.H.R.* VII (1927), No. 1.
- Mendizábel, Miguel O., "Los Minerales de Pachuca y Real del Monte en la época Colonial," *El Trimestre Económico*, VIII, 253-309.
- Mill, Nicholas, *The History of Mexico . . . also observations as to the best means of working the Mexican Mines* (London, 1824).
- Ordóñez, Ezequiel, and Rangel, M., "El Real del Monte," Instituto Geológico de México, *Boletín* No. 12.
- Orozco y Berra, Manuel, "Informe sobre la Acunacion en las Casas de Moneda de la Republica," in G. Manuel Siliceo (ed.), *Memoria de la Secretaria de Fomento, Colonizacion, Industria y Comercio* (Mexico, 1857).

- Peña, Francisco, *Estudio Histórico sobre San Luis Potosí* (San Luis Potosí, 1894).
- Perez Verdia, Luis, *Historia Particular del Estado de Jalisco*, 3 vols. (Guadalajara, 1910).
- Powell, Philip Wayne, "Spanish Warfare against the Chichimecas in the 1570's," *H.A.H.R.* XXIV, No. 4.
- Priestley, Herbert I., *José de Gálvez, Visitor-General of New Spain* (1765-1771), (Berkeley: University of California Press, 1916).
- Ramirez, Santiago, *Datos para la Historia del Colegio de Minería* (Mexico, 1890). This work has been of great value in the present study, particularly in the chapter on the School of Mines. According to the author it was based principally on what remained at the time of the original archive of the Tribunal, then conserved in the *Colegio de Minería*. It has been compared with the MS. *Minería: Ordenes y Oficios*, 1801-1808 — apparently all that remains intact today of that Archive — and has been found to be accurate for those years. Hence considerable reliance has been placed on it to fill in gaps in the source material.
- *Noticia Historica de la Riqueza Minera de Mexico* (Mexico, 1884). This work was not as valuable for the purposes of this study as the above. It is a general work of considerable interest but with little specific information on the *Cuerpo de Minería*.
- Riva Palacio, Vicente (ed.), *México a través de los Siglos*, 5 vols. (Barcelona, 1888-89).
- Rivera, Augustin, *Principios Criticos sobre el Vireinato de la Nueva España i sobre la Revolucion de Independencia*, 3 vols. (San Juan de los Lagos, 1884-1888).
- Roscher, Wilhelm Georg Friedrich, *The Spanish Colonial System* (New York, 1904), E. G. Bourne, ed.
- Selleria, Carlos, *Data referring to Mexican Mining, prepared in view of the participation of Mexico in the Universal Exposition of Paris, 1900* (Mexico, 1901).
- Smith, Donald E., *The Viceroy of New Spain* (Berkeley, 1900).
- Smith, Robert S., "The Institution of the Consulado in New Spain," *H.A.H.R.* XXIV, No. 1.
- Tamayo, Jorge L., "La Minería de Nueva España en 1794," *El Trimestre Económico*, X, 287-319.

- Taribio Polo José, *Reseña histórica de la minería en el Peru* (Lima, imp. Artes Graficas, 1911).
- Vander Linden, Herman, *L'Expansion Coloniale de l'Espagne jusqu'au Debut du XIX<sup>e</sup> siècle*, in C. de Lannoy and H. Vander Linden, *Histoire de l'Expansion Coloniale des Peuples Europeens* (Brussels, 1907).
- Velarde, Carlos E., *Historia del derecho de minería hispano-Americano* (Buenos Aires, 1919).
- Villarroel, Hipolito, *Enfermedades Politicas que padece el Capital de esta Nueva España, en casi todos los Cuerpos que se compone, y Remedios que se la deben aplicar para su Curacion si se quiere que sea útil al Publico*, in *Voz de la Patria*, Tomo IV, Suplemento Numero I, Mexico, September 11, 1830, under the title *México por dentro y fuera*. C. M. Bustamente, ed.
- Ward, Bernado, *Proyecto Económico en que se proponen varios providencias dirigidas a promover los intereses de España, con los medios y fondos necesarios para su plantificacion* (Mexico, 1779).
- Whitaker, Arthur P., *The Huancavelica Mercury Mine*, Harvard Historical Monographs XVI (Cambridge: Harvard University Press, 1941).
- *Latin America and the Enlightenment* (New York: Appleton-Century, 1942).
- "More about Fausto de Elhuyar," *Revista de historia de America*, No. 10.
- Wiley, John M., *Historical Report on the principal mines in the State of Guanajuato* (Philadelphia, 1904).
- Zamacois, Niceto de, *Historia de Méjico desde sus Tiempos más remotos hasta Nuestros Días*, 18 vols. (Mexico, 1877-1882).

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